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ATTENTION: Guide Holders

March 31, 1994 Update to the GUIDE

Reflecting Secretary O'Leary's focus on occupational safety and health, the Office of Occupational Safety is pleased to provide you with the latest update to the **DOE Interpretations Guide to OSH Standards**. The Guide was developed in cooperation with the Occupational Safety and Health Administration, which continued its support during this last revision by facilitating access to the interpretations found on the OSHA Computerized Information System (OCIS).

This update contains 123 formal interpretation letters written by OSHA. As a result of the unique requests received by the 1-800 Response Line, this update also contains 38 interpretations developed by DOE. This new occupational safety and health information adds still more important guidance to the four volume reference set that you presently have in your possession.

As with the last update, you are requested to follow the attached instructions on incorporating this update into your current set of binders. The feedback from those Guide holders who took a few minutes to fill out the questionnaire accompanying the last update was appreciated and suggested improvements incorporated where possible. It was reassuring to learn that many of you use the Guide regularly. The preference for maintaining a hard copy version along with an electronic version was stronger than we anticipated, too.

As mentioned in the last update, the entire Guide will soon be available on Technical Information Service (TIS), a new computer service containing occupational safety and health databases. This will permit users to rapidly search for information contained in the Guide. Any questions about the Guide should be directed to Raymond Rogers of the Technical Support Division, EH-312 at (301) 903-7331.

MASTER

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RECORD ID 1688

STANDARD NUMBER AIDs Prevention: 1910.132(a); 1910.22(a)(1); (a)(2); 1910.141; 1910.145

INFORMATION DATE 871228

ABSTRACT This interpretation letter addresses implementation of the Center for Disease Control's (CDC) recommendations for prevention of HIV transmission in health-care settings. OSHA recommends the implementation of the CDC's recommendations for prevention of HIV transmission in health-care settings.

(NOTE: OSHA has since put into effect standard specifically for laboratory exposures, 29CFR 1910.1450.)

INTERPRETATION AIDs Prevention: 1910.132(a); 1910.22(a)(1); (a)(2); 1910.141; 1910.145

DEC 28, 1987

This is in response to your letter of October 29, requesting the Occupational Safety and Health Administration's (OSHA) current stance on implementation of the Center for Disease Control's (CDC) Recommendations for Prevention of HIV Transmission in Health-Care Settings, August 21, 1987.

OSHA recommends the use of the CDC guidelines for the prevention of Human Immunodeficiency Virus (HIV) and other blood-borne infectious diseases in laboratories. The following OSHA standards will be considered for protecting laboratory workers from potential exposure to blood-borne diseases:

29 CFR 1910.132 -- Personal Protective Equipment
29 CFR 1910.22(a)(1) and (a)(2) -- General Housekeeping Requirements
29 CFR 1910.141(a)(4)(ii) -- Sanitation, Waste Disposal
29 CFR 1910.145 -- Specification for Accident Prevention Signs and Tags
Section 5(a)(1) -- General Duty Clause Standards

I have enclosed, for your information, a copy of the standards and the Act. Employers who are found to be in violation of the OSHA standards, or of Section 5(a)(1) of the Occupational Safety and Health Act (OSH Act), may be assessed penalties in accordance with the OSH Act's guidelines. However, the OSH Act and the Agency's implementing guidelines and procedures permit some flexibility in the assessment of penalties.

SOURCE LETTER

October 29, 1987

Please forward OSHA's current stance on implementation of the Center for Disease Control's Recommendations for Prevention of HIV Transmission in Health-Care Settings as printed in the August 21, 1987, issue of Morbidity and Mortality Weekly Report.

I would particularly be interested in the flexibility that laboratory workers will be allowed in interpreting and implementing the "universal blood and body precautions."

RECORD ID 1691

STANDARD NUMBER AIDs Prevention: 1910.132(a); 1910.22(a)(1); 1910.141(a)(4); 1910.145
INFORMATION DATE 871106

ABSTRACT This interpretation letter responds to a letter concerning a newspaper article entitled "Fine for Hospitals Exposing Workers to Aids." Guidelines and standards are specified to protect workers from blood-borne infectious diseases in hospitals.

INTERPRETATION AIDs Prevention: 29 CFR 1910.132(a); 1910.22(a)(1); 1910.141(a)(4); 1910.145

NOV 6, 1987

This is in response to your letter of October 6 concerning a newspaper article entitled "Fine for Hospital Exposing Workers to AIDS," Newsday, July 24, 1987.

The Occupational Safety and Health Administration (OSHA) recommends the use of the Centers for Disease Control (CDC) guidelines for the prevention of Human Immunodeficiency Virus (HIV) and other blood-borne infectious diseases in hospitals. The following OSHA standards will be considered for protecting health care workers from potential exposure to blood-borne diseases:

29 CFR 1910.132--Personal Protective Equipment

29 CFR 1910.22(a)(1) and (a)(2)-- General Housekeeping Requirements

29 CFR 1910.141(a)(4)(i)--Sanitation, Waste Disposal

29 CFR 1910.145--Specification for Accident Prevention Signs and Tags

Section 5(a)(1)--General Duty Clause

Employers who are found to be in violation of OSHA standards, or of Section 5(a)(1) of the Occupational Safety and Health Act (OSH Act), may be assessed penalties in accordance with the OSH Act's guidelines. Under the OSH Act, a violation determined to be willful in nature may be assessed a penalty up to $10,000. However, a willful violation and its corresponding sanction is reserved for extreme circumstances where employers knowingly disregard safe practices. The OSH Act and the Agency's implementing guidelines and procedures permit some flexibility in the assessment of penalties, therefore, many citations result in no penalty at all.

SOURCE LETTER

October 6, 1987

Enclosed please find a copy of a newspaper article entitled "Fine for Hospitals Exposing workers to AIDS," Newsday, July 24, 1987. The article indicates that your agency can now fine hospitals that fail to comply with guidelines drawn up by The Centers for Disease Control in order to protect their employees from HIV infection. Is this an accurate statement?

RECORD ID 2913

STANDARD NUMBER AIDS (Hepatitis B Vaccine)
INFORMATION DATE 891121

ABSTRACT OSHA Instruction CPL 2-2.44A on Enforcement Procedures for Occupational Exposure to HBV and HIV, states that needles shall not be recapped by hand. The (Product) needle recapping device by (Company A) will not provide adequate protection since the shield is not big enough to cover the entire hand, especially a large hand. The re-capper syringe recapping device by (Company B) appears to provide adequate protection for larger gauge needles. Therefore, the device should only be used with larger gauge needles.

(NOTE: CPL updated to 2-2.44B.)

INTERPRETATION AIDS (Hepatitis B Vaccine)

NOV 21, 1989

MEMORANDUM

SUBJECT:
1. (Product) needle shield by (Company A)
2. The Re-capper by (Company B) Corporation

I have been sent two syringe recapping devices by OSHA field personnel to render a professional opinion as to the effectiveness of the devices. As you well know, OSHA Instruction CPL 2-2.44A, subject: Enforcement Procedures for Occupational Exposure to HBV and HIV, states that needles shall not be recapped by hand.

I consulted with personnel in the Directorate of Health Standards Program who are currently working on the development of the bloodborne pathogens standard regarding these two devices.

It is my opinion, and the opinion of Health Standards personnel, that the (Product) needle recapping device will not provide adequate protection since the shield is not big enough to cover the entire hand, especially a large hand.

The Re-capper syringe recapping device appears to provide adequate protection for larger gauge needles. I unsuccessfully tried recapping a 1cc 25G 5/8 tuberculin syringe and needle with the Re-capper. Therefore, the device should only be used with larger gauge needles.

RECORD ID 3085

STANDARD NUMBER AIDS (HBV Germicides)
INFORMATION DATE 891003

ABSTRACT This interpretation responds to questions concerning the use of germicides to clean up blood or body fluid spills. A germicide which is an EPA-registered "hospital disinfectant" that has a label claim for tuberculocidal activity is required for surfaces visibly contaminated with blood or body fluids. EPA-registered disinfectants with no claim for tuberculocidal activity can be used for routine housekeeping in absence of visible blood or body fluid contamination. Products which are EPA- registered sterilants are the only products which EPA allows to claim inactivation of HBV. OSHA has adopted CDC's recommendation that tuberculocidal hospital disinfectants be used for decontamination of blood or body fluid spills.

INTERPRETATION AIDS (HBV Germicides)

OCT 3, 1989

This is in reply to your letter concerning the use of germicides to clean up blood or body fluid spills.

Answers to your questions are as follows:

1. A germicide which is an EPA-registered "hospital disinfectant" D.C. that has a label claim for tuberculocidal activity is required D.C. for those surfaces which are visibly contaminated with blood D.C. or body fluids. EPA-registered "hospital disinfectants" which D.C. have no label claim for tuberculocidal activity can be used D.C. for routine housekeeping in the absence of visible blood or D.C. body fluid contamination.

   In lieu of an EPA-registered "hospital disinfectant" which is D.C. tuberculocidal, a solution of 5.25% sodium hypochlorite D.C. (bleach) may be used in dilutions between 1:10 and 1:100.

2. Germicidal products which are tuberculocidal have a wide range D.C. of product bases; therefore, such products are not strictly D.C. phenolic or alcohol based.

3. The use of germicides is required for disinfection as D.C. described above; however, one may pre-clean an area of visible D.C. contamination prior to applying a germicidal solution for D.C. disinfection.

With your letter was enclosed a copy of a letter written by our (City) Regional Office. The letter states that quaternary ammonium compounds "are not fully effective in inactivating HBV...."

You should be aware that the Centers for Disease Control (CDC) and the Environmental Protection Agency (EPA) have not concluded that quaternary ammonium compounds as a class are ineffective in inactivating HBV. No product is able to be tested for effectiveness in deactivating HBV since the virus is not able to be cultured in presently available assay tests. Products which are EPA-registered sterilants are the only products which EPA allows to claim inactivation of HBV due to its sterilant properties as opposed to disinfectants which are tuberculocidal and which kill most viruses and most fungi.

The CDC in formulating its recommendations concerning universal precautions did not require that sterilants be used for decontamination of blood or body fluid spills. The CDC recommended the use of hospital disinfectants which are tuberculocidal. This recommendation has been adopted by OSHA in its enforcement strategy.

You may obtain a listing of products which are EPA registered germicides by contacting:

U.S. Environmental Protection Agency /Antimicrobial Program Branch
Registration Division (TS-767C)/Office of Pesticides Programs
401 M Street, S.W.
Washington, D.C. 20460

RECORD ID 3750

STANDARD NUMBER AIDS (Hepatitis B Vaccine)
INFORMATION DATE 900525

ABSTRACT This letter clarifies and confirms the OSHA requirement, under Section 5(a)(1) of the Occupational Safety and Health Act of 1970, that employers offer the hepatitis B vaccine to employees. New hires should receive orientation which provides information on the hazards of bloodborne pathogens. OSHA requires the vaccine to be given over a prescribed period of time. However, there is no evidence which would warrant a cessation of work until the series is completed. Therefore, workers may start working before the series is completed. Both probationary employees and short-term employees must be offered the same protection if they are exposed to the same hazards as non-probationary and long term employees.

INTERPRETATION AIDS (Hepatitis B Vaccine)

MAY 25, 1990

This letter will reiterate and confirm our discussion of May 9, regarding the Occupational Safety and Health Administration's (OSHA) requirement, under Section 5(a) (1) of the Occupational Safety and Health Act of 1970, that employers offer the hepatitis B vaccine to employees. For clarity we will restate each of your questions and follow it with our response.

Question 1:

Can new employees start working before the series of three vaccinations is completed?

Answer:

OSHA requires that the vaccine be offered in amounts and at times prescribed by standard medical practice. There is no evidence which would warrant a cessation of work until the series is completed. Therefore, new employees may start working before the series is completed.

OSHA anticipates that new hires will receive an orientation session to include the hazards (chemical, physical, and biological) of their work environment. This session should provide information on the hazards of bloodborne pathogens and the availability, free of charge, of the vaccine. Because of the risk of exposure to hepatitis B to employees, OSHA expects this information to be offered, and arrangements made for those employees who choose to receive the vaccine, with all deliberate speed. OSHA will, of course, take into a consideration the availability of the vaccine and efforts exerted by the employer to obtain it.

Question 2:

What is OSHA's policy on probationary employees?

Answer:

If probationary employees work in the same situations which place non-probationary employees at risk, then they are exposed to the same hazards and must be provided the same protection within the same time frame as other new employees.

Question 3:

What is OSHA's policy on short-term employees?

Answer:

If short-term employees work in the same situations which place permanent employees at risk, then they are exposed to the same hazards and must be provided the same protection. As discussed in my answer to Question 1, these employees should be provided with the information and the vaccine in a timely manner.

Of course, employees who are hired as receptionists or bookkeepers need not be offered the vaccine if they have no exposure to bloodborne hazards.

RECORD ID 4075

STANDARD NUMBER AIDS (Hepatitis B Vaccine)
INFORMATION DATE 900525

ABSTRACT This interpretation cites the February 2 Morbidity and Mortality Weekly Report as the Centers for Disease Control's updated information on protection against viral hepatitis. The MMWR discusses the appropriateness of intradermal vaccination under research protocol only, and with the employee's 'informed consent,' which includes offering those affected the choice to obtain the vaccine by normal route and amount. The Report also describes persons considered to be at occupational risk.

INTERPRETATION AIDS (Hepatitis B Vaccine)

MAY 25, 1990

SUBJECT: February 2 MMWR on Protection Against Viral Hepatitis

The above referenced Morbidity and Mortality Weekly Report is being forwarded to you as the Centers for Disease Control's (CDC) updated information on protection against viral hepatitis.

In particular, please note information on page 12 which discusses the appropriateness of intradermal vaccination under research protocol only and with "appropriate informed consent" of the employee. The CDC has explained that 'informed consent' includes offering those affected the choice to obtain the vaccine by the normal route and in the normal amount. Page 14 describes persons considered to be at occupational risk.

RECORD ID 2489

STANDARD NUMBER Amubags
INFORMATION DATE 860403

ABSTRACT OSHA does not have a standard which requires the use of Bag Valve Masks (Amubags) or similar equipment by persons administering mouth-to- mouth resuscitation.

INTERPRETATION Amubags

APR 3, 1986

MEMORANDUM

SUBJECT: "Ambu" Bags (Bag Valve Masks) - Pocket Masks

Further to my discussion with Mr. M regarding Mr. L's complaint, I want to reiterate the points I made during that discussion:

1. Mr. L's concern regarding the potential transmission of infectious disease through mouth-to-mouth resuscitation is well taken.

2. CDC has recommended that Bag Valve Masks (Ambu bags) or similar equipment with short tubes be used by persons administering mouth-to-mouth resuscitation.

3. OSHA does not have a standard which requires the use of this equipment. Although to the best of my knowledge, most large city emergency rooms today have bags and masks available, it may not be an industry-wide practice. Particularly where small hospitals are concerned, this equipment may not be available or supplied. The National Association for Emergency Medical Technicians does not have any statistics on the use of this equipment. The information, therefore, is anecdotal, based on discussion with physicians at CDC and local hospitals.

RECORD ID 2430

STANDARD NUMBER Asbestos Abatement Insurance
INFORMATION DATE 860806

ABSTRACT Concerns about the extreme difficulties asbestos abatement consultants are experiencing in obtaining professional liability insurance at an affordable price should be referred to the Department of Justice.

INTERPRETATION Asbestos Abatement Insurance

AUG 6, 1986

This is in response to your letter of July 7, concerning your constituents, Mr. and Ms. L of (Company), in (City), (State) These individuals expressed concern about the extreme difficulties asbestos abatement consultants are experiencing in obtaining professional liability insurance at an affordable price.

The Occupational Safety and Health Administration (OSHA) is a standards setting and enforcement agency that deals with matters of occupational safety and health. Although we can appreciate the concerns of your constituents, we are not in a position to address their difficulty with insurance as OSHA has no experience or jurisdiction in that area.

Correspondence about problems such as those of concern to your constituents should be addressed to the Department of Justice at the following address:

Assistant Attorney General/Civil Division
Department of Justice/Room 3143
10th and Constitution Avenue, N.W.
Washington, D. C. 20530

SOURCE LETTERS

JUL 7, 1986
I have received the attached letter from a consulting firm specializing in asbestos removal.
I would appreciate your review and advice on the questions raised on insurance premiums.

JUN 24, 1986

RE: SENATE BILLS S2300 & S2083.

We wish to applaud and encourage your efforts to strengthen and expand present legislation dealing with the hazards associated with exposure to asbestos fibers. Previous bills and regulations seemed deliberately designed to skirt the issue but S2300 and S2083 appear to face the issue squarely by demanding appropriate action.

An additional step worthy of your consideration is to also address the extreme difficulties asbestos abatement consultants are experiencing in obtaining professional liability insurance at an an affordable price (at any price in many instances). It is a paradox that we who have the training, expertise and experience necessary to assist in alleviating the asbestos hazard are penalized and effectively prevented from doing so by the lack of liability insurance. Somehow, we must convince or force the insurance industry to recognize the fact that consultants and contractors who are trying desperately to correct this hazardous situation should not be classified as equivalent risks to those manufacturers who caused the problem. There is no basis for comparison of the potential liabilities. Further, the overall potential for asbestos injury claims is being heightened by discouraging our abatement efforts; thus prolonging the exposure to a hazardous situation.

Again, we fully support your efforts. If you can also address the insurance dilemma, you will be performing an invaluable service to every building owner in America as well as the people who occupy those buildings.

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RECORD ID 2108

STANDARD NUMBER Cranes Underhung; 1910.179(b)(1)
INFORMATION DATE 850314

ABSTRACT Citations concerning the use of underhung cranes and monorails can be prepared using Paragraph 5(a)(1) of the OSHA Act and referencing ANSI B30.11. There is no difference in the terms transfer and dispense as applied to the use of flammable liquids (Standards 1910.106, 1910.107), and therefore they can be used interchangeably. Also, in transferring flammable liquids the use of compressed air is prohibited; pumps must be used.

INTERPRETATION Cranes Underhung; 1910.179(b)(1)

MAR 14, 1985

I am sending you the interpretations on the underhung cranes and flammable liquids that you requested on March 7, 1985.

The only way you can cite Monorails and Underhung Cranes is by 5(a)(1), using the ANSI B 30.11 standard as a reference. If you don't have this ANSI standard, we could provide you with a copy.

On flammable liquids, there is no difference between transfer and dispense per Webster's Collegiate Dictionary, 1979, paragraph 8-4.3.1 and .2, where it states, "the use of compressed air as a transferring medium shall be prohibited." The proper pumps shall be used.

RECORD ID 2988

STANDARD NUMBER Cumulative Trauma Disorder (CTD) (Employment Screening)
INFORMATION DATE 890914

ABSTRACT This interpretation states OSHA's technical position on employment screening, job rotation, and light duty for cumulative trauma disorder risk factor abatement. The memo suggests the use of the term "baseline health surveillance" in future citations rather than "pre-employment screening", discusses the use and design of job rotation, and defines "Light duty" as being synonymous with "restricted activity".

INTERPRETATION Cumulative Trauma Disorder (CTD) (Employment Screening)

SEP 14, 1989

SUBJECT: OFP 1589 Letter

The Directorate of Technical Support was asked on August 22, by the Office of Field Programs to provide a technical position on employment screening, job rotation, and light duty for cumulative trauma disorder (CTD) risk factor abatement.

1. The term "baseline health surveillance" is suggested instead of "pre-employment screening" for the alleged variable description of future citations. The purpose of baseline surveillance is to establish a reference point from which changes in health status may be evaluated. Both OSHA and NIOSH recognize that there is no established scientifically valid way to identify individuals who may develop CTD in the future.

2. Job rotation is a method of reducing the duration of a given set of CTD risk factors. The job rotation should be designed in conjunction with an individual who is qualified to evaluate the additive effect of a set of risk factors for each job within a work position. This may be a way of offering some interim protection until more effective engineering and work method changes can be implemented.

3. "Light duty" is a term which is used synonymously with "restricted activity" to indicate an assignment with reduced stress from risk factors.

SOURCE LETTERS

AUG 22, 1989

SUBJECT: Letter regarding Recent Cumulative Trauma Disorder Citations

The attached letter transmits her concerns about certain aspects of recent cumulative trauma disorder citations issued by OSHA. She specifically addresses pre-employment screening, job rotation, and light duty. Please consider this point raised and respond to us with your position within 30 days. Please reference OFP #1589.

JUN 15, 1989

As a follow up to our phone conversation, I want to restate our concern regarding some of the abatement measures included in recent OSHA cumulative trauma hazard citations.

In specific, many recent citations (see attached for the most recent example) contain language requiring or suggesting employers to conduct pre-employment screening of workers. This gives the appearance that OSHA is suggesting that employers screen and weed out all employees susceptible to CTD's.

I doubt this is what OSHA was intending. Especially since there are no predisposing factors for CTD's, except of course if a worker was previously diagnosed. However, this gets into state laws on discriminating against the handicapped.

This language should be excluded from citation language unless OSHA can assign a use to this exam. We feel strongly that this language should be omitted for cumulative trauma hazards.

The other item of concern to us is the reliance of "job rotation" as a potential solution in these citations. In meatpacking, for example, many of the citations have included this as an abatement measure. However, unless the rotation is designed by an ergonomist - so that one is sure that different muscle groups are being used, and unless there is a provision for rate retention, job rotation can not only further injure workers, but they could be penalized because their job causes CTD's. I have enclosed a letter regarding job rotation for your information.

Furthermore, most plants have few "light duty" jobs that must be preserved for injured workers. If these are put in a job rotation program, then you have limited the ability for the plant to fully implement a sound medical management program.

We strongly urge the agency to omit job rotation as a recommended solution.

RECORD ID 1653

STANDARD NUMBER Cyanide Antidote
INFORMATION DATE 880517

ABSTRACT Updated information on cyanide antidote kits. Administration of Amyl Nitrite by the designated first aid responder is the medically accepted first response. Hydroxy Cobalamine has had limited use as an alternate to the administration of intravenous sodium nitrite.

INTERPRETATION Cyanide Antidote

MAY 17, 1988

MEMORANDUM

SUBJECT: Cyanide Antidote Kits

This memo is in response to your correspondence of April 27, regarding updated information on Cyanide Antidote Kits since my August, 1986 letter. As per my 1986 memo, Amyl Nitrite continues to require a physician's prescription and the administration of this drug in an emergency situation by the designated first aide responder is the medically accepted initial response. According to current literature, hydroxy cobalamine has had limited use as an alternative intravenous medication to the widely accepted sodium nitrite protocol. I had my staff contact Mr. W, PhD from (Company), the manufacturers of the commercially available Cyanide Emergency Kit, to determine if any new products or methods are being developed to address cyanide poisoning. Dr. W informed us that there were no future plans to alter the emergency kit or develop alternative antidotes.

SOURCE LETTER

APR 27, 1988

MEMORANDUM

SUBJECT: Cyanide Antidote Kits

We have reviewed your memo of August 8, 1986, regarding the use of Cyanide Antidote Kits. We are requesting any new information since the August, 1986 memo.

Specifically, we request guidance on the ability to use amyl nitrite (now a prescription drug), training requirements to administer such a drug, any acceptable alternatives to amyl nitrite such as hydroxy cobalamine, and guidance on its use.

RECORD ID 1716

STANDARD NUMBER Diesel Emissions: 1910.1000; 1910.1
INFORMATION DATE 851108

ABSTRACT Carbon monoxide and sulfur dioxide are components of diesel engine emissions.

(Note: The PEL for carbon monoxide is now 35 ppm.)

INTERPRETATION Diesel Emissions: 1910.1000; 1910.1

NOV 8, 1985

This is in response to your recent letter, regarding the hazardous components of diesel engine emission. I apologize for the delay in responding to your inquiry.

One of the components in diesel engine emissions is carbon monoxide. The Occupational Safety and Health Administration (OSHA) standard for carbon monoxide (CO) is 50 parts of air. The adverse health effects of exposure to carbon monoxide are asphyxiation, and anoxia.

The symptoms of acute CO poisoning are headache, dizziness, drowsiness, nausea, vomiting, collapse, coma, and death.

Diesel engine exhaust emissions also contain sulfur dioxide (SO_2). OSHA's permissible exposure limit for SO_2 is 5 parts SO_2 per 1 million parts air.

Exposure to SO_2 may result in broncho-constriction, fatigue, altered sense of smell, and the symptoms of chronic bronchitis.

It is impossible to tell if your place of employment is in compliance with OSHA's permissible exposure limits for any air contaminant without taking air samples.

We encourage you to contact the OSHA area office having jurisdiction over your locality to discuss your specific concerns about diesel emissions, air quality in your workplace and adverse health effects.

SOURCE LETTER

(No Date)

I am in need of information on the exhaust emission from diesel engines. If I can't convince my union or my company that it isn't safe to breathe these fumes 8 hours a day I may lose my job after 27 years and 7 years short of retirement. I understand that a couple of employees have went to the doctor but I see no point. After one days lose I have trouble breathing for weeks afterward. If the company & the union don't believe me I doubt if a local "pill pusher" will.

Somewhere there must be information on this but I can't find it. Any information you can give will be gratefully received.

RECORD ID 2506

STANDARD NUMBER Dormitory Smoking
INFORMATION DATE 860507

ABSTRACT OSHA has no regulations that apply to smoking, however, OSHA does have a standard which limits exposure to carbon monoxide which is one of the products from the combustion of tobacco.

INTERPRETATION Dormitory Smoking

MAY 7, 1986

This is in response to your inquiry concerning the Occupational Safety and Health Administration (OSHA) regulations that apply to smoking in dormitories.

OSHA is charged with protecting the safety and health of workers and does not regulate the ventilation of residences. Currently, OSHA has no regulations that apply to smoking, however, OSHA does have a standard which limits employee exposure to carbon monoxide one of the products from the combustion of tobacco. The current OSHA permissible exposure limit (PEL) for carbon monoxide is 50 parts of carbon monoxide per million parts of air averaged over an 8-hour work day. I have enclosed the "NIOSH/OSHA Occupational Health Guideline for Carbon Monoxide" for your use. This guideline provided information on the health effects associated with carbon monoxide exposure.

Also, you may want to write to the U.S. Environmental Protection Agency (EPA) concerning this matter. EPA is responsible for protecting the health of the general public and may have guidelines that apply to smoking. The address is:

EPA
401 M Street, S.W.
Washington, D.C. 20640

I have also enclosed an article entitled "The Problem of Passive Smoking" by James L. Replace of EPA for your use and a bibliography of references on tobacco smoke compiled by the National Capital Area Lung Associations. Concerning the occupational safety and health manual that you mentioned in your letter, I suspect that this manual was developed by your installation. I suggest that you ask you dormitory manager for a copy.

SOURCE LETTER

APR 4, 1986

The Manager of the Dormitory in which I now reside recently sent a note to me stating:

> "The Dormitory living quarters meets current health and safety standards as set forth by the Occupational Safety and Health Manual. Ventilation in these areas has been found to be adequate for smokers and non-smokers."

What are these standards? How can a room appr. 15' x 9' with three smokers be guaranteed not to affect a non-smoker in the same room?

Can you please send my a copy of the manual mentioned in the quote? Can you identify the possible carcinogens or toxic substances in such a situation?

RECORD ID D93040101

STANDARD NUMBER Department of Energy Order 5484.1, Change 6
INFORMATION DATE 930401

ABSTRACT This interpretation letter address requirements contained in the Department of Energy (DOE) Order 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements", dated 2-24-81, as they relate to the conducting of Type B investigation for an occupational illness subsequent to a Type B investigation for a similar illness.

INTERPRETATION Department of Energy Order 5484.1, Change 6

This interpretation is in response to a January 29, 1993, request from a DOE Field Office regarding the initiation of Type B investigations for occurrences which result from cumulative trauma syndrome (CTS) illnesses.

The accident investigation requirements established in Department of Energy Order 5484.1, apply in this situation. This Order requires that a Type B investigation be conducted for occupational illness cases that result in inpatient hospitalization, or for any occupational illness that is a lost workday case involving more than 5 days away from work. The requirement was established to help identify causes and deficiencies that needed to be addressed, it was not intended to create a duplication of effort.

The field office correspondence stated that a comprehensive Type B investigation of 25 CTS illnesses, which occurred at a contractor site under its purview, had been conducted by the affected contractor in 1992. The letter further stated that the ongoing implementation of the recommendations would take considerable time and resources. Since that time, several additional CTS cases have occurred that meet the criteria for a Type B investigation. The field office questioned the need to conduct investigations for these cases since the resulting recommendations would basically be the same as for the first investigation. They also indicated that the contractor had already performed evaluations of the work stations of employees who had been diagnosed with CTS.

A board investigation for occurrences may not always be warranted. On page II-1, paragraph 1.a. of the Order, the head of the cognizant field organization, with the concurrence of the Director of the Operational and Environmental Safety Division (currently the Deputy Assistant Secretary for Safety and Quality Assurance, EH-30), may determine on a case-by-case basis that a board investigation is not necessary even though it is required by the Order. A request for such a determination must be initiated by the head of the field organization through correspondence with EH-30.

A decision to waive a board investigation, however, does not waive other requirements for reporting the occurrence. For example, an occupational illness would still have to be investigated and reported as a Type C occurrence in the manner prescribed by the Order.

RECORD ID D9308015

STANDARD NUMBER DOE Order 5483.1A; 1903.2
INFORMATION DATE 930811

ABSTRACT This interpretation letter addresses the requirements for the posting of OSHA Safety and Health Posters.

Each DOE facility is required to post a DOE Safety and Health poster equivalent to the OSHA poster, and it shall be displayed in a significant number of places to ensure that all employees have the opportunity to observe it.

INTERPRETATION DOE Order 5483.1A; 29 CFR 1903.2

This interpretation is in response to your letter dated August 12, 1993, asking if DOE facilities are required to display OSHA posters.

DOE Order 5483.1A requires each DOE contractor to post the DOE Safety and Health poster (DOE F 5480.2), which is equivalent to the OSHA poster. These forms shall be posted in a significant number of places to permit employees the opportunity to observe the information en route to or from their work place.

OSHA requires in 29 CFR 1903.2 (Posting of notice; availability of the Act, regulations and applicable standards) that notices shall be posted by the employer in a conspicuous place or places where notices to employees are customarily posted. When posted by the employer, posters informing employees of their protections and obligations shall constitute compliance with the posting requirements of section 8(c)(1) of the Act.

To answer your question, each DOE facility is required to post the DOE Safety and Health poster, which is equivalent to the OSHA poster. It shall be posted such that all employees have the opportunity to observe the information en route to or from their work place.

RECORD ID D9308040

STANDARD NUMBER DOE Order 5480.11; 1910.96 (b)
INFORMATION DATE 931208

ABSTRACT This interpretation provides guidance on whether employers are obligated to make a position available for the prevention of radiation exposure to [pregnant] female workers.

INTERPRETATION DOE Order 5480.11; 29 CFR 1910.96 (b)

This interpretation is in response to your inquiry of August 25, 1993, requesting guidance on whether employers are obligated to make a position available for the prevention of radiation exposure to [pregnant] female workers.

DOE's policy regarding radiation exposure to pregnant female workers is to provide protection to the embryo or fetus in a manner that does not discriminate against the rights of the declared pregnant radiological worker. Both the DOE Order 5480.11 (Section 9.b.3-Unborn Child), and the DOE Radiological Control Manual (Section 215-Embryo/Fetus Dose Limits) contain references to DOE regulations regarding dose limits and work restrictions for female radiological workers who have formally declared their pregnancy.

It is important to ensure that programs for assessing and controlling fetal exposure do not cause job discrimination. However, this caution must be balanced against the desire to protect the embryo or fetus. The Supreme Court, in "Johnson Controls versus United Auto Workers," addressed fetal protection policies. In its ruling, the Supreme Court declared that the welfare of future children must be decided by parents who conceive, bear, support, and raise them rather than by the employers who hire those parents or the court. The female worker, then, is solely and fundamentally responsible for deciding whether to formally declare her pregnancy and, in doing so, become subject to additional limits and restrictions on her dose. In deciding whether or not to accept the risk resulting from radiation exposure of the embryo or fetus, the female radiological worker alone is responsible for judging the magnitude of the risk and comparing this risk against other risks, whether real or perceived.

The DOE Radiological Control Manual, Section 215, states that "The employer shall provide the option of a mutually agreeable assignment of work tasks without loss of pay or promotional opportunity, such that further occupational radiation exposure is unlikely." It should be noted that radiological work restrictions apply only to <u>declared</u> pregnant workers. If a worker does not declare her pregnancy, she should not be restricted in her work or in the dose that she obtains, beyond the restrictions that apply to all radiological workers.

OSHA Instruction CPL 2.78

FEB 9, 1987

SUBJECT: Regional Ergonomics Program

A. Purpose. This instruction republishes OSHA Notice CPL 2, May 12, 1986, which provided direction and established goals for use by OSHA personnel in the development of an ergonomics program for technical assistance as well as broad guidelines to be followed while conducting ergonomically related enforcement activities at the workplace. The contents of the notice have not been changed.

B. Scope. This instruction shall apply OSHA-wide.

C. Action. OSHA National Office Directors, Regional Administrators and Area Directors shall ensure that the procedures set forth in sections G. through I. of this instruction are followed.

D. Federal Program Change. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Encourage State adoption of a similar initiative and explain the content of this change to the State designee as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal instruction in writing, within 30 days of notification, to the Regional Administrator if they have not already responded to the OSHA Notice which this instruction republishes. This acknowledgment should indicate whether the State chooses to adopt the change and, if so, a description of the State's plan to implement the change.

a. If a State intends to follow the requirements and proceduresoutlined in this instruction (adapted as appropriate to the State'sorganizational structure, standards and staff training needs), only a written indication of intent is needed.

b. Any alternate requirements and procedures must be submitted as a State plan supplement within 6 months.

E. 7(c) (1) Consultation Programs. Regional Administrators shall forward a copy of this instruction to each consultation project manager.

1. The technical content of the instruction shall be explained as requested.

2. Consultation project managers shall ensure that all appropriate requirements and procedures are adhered to by consultation program personnel.Routine monitoring activities shall be used to determine whether this instruction is being implemented.

F. Background. OSHA's mandate is to ensure that employers provide a safe and healthful workplace. Traditionally the agency has sought to accomplish this objective primarily through compliance inspections, However, no specific standards exist for ergonomic hazards at present. This in turn reduces the ability of the conventional approach to identify and seek reduction of these hazards. Thus, to reduce the incidence of these ergonomic problems alternative strategies must be employed.

1. Although musculoskeletal disorders account for few work-related deaths, they do account for a significant amount of human suffering, loss of productivity, and economic burden on compensation systems. For example, data from government sources indicate:

a. Musculoskeletal disorders rank first among health problems affecting the quality of life, as measured by the extent to which they cause significant limitation of activity (NCHS, HIS,1977).

b. Musculoskeletal disorders are the leading cause of disability of people in their working years, afflicting 19 million (NCHS, HIS, 1977). High risk industries include manufacturing, construction and food processing. Nearly one-half of the nation's work force is affected at some time during their working lives.

c. Musculoskeletal disorders also represent a significant accessory or causal factor in a large number of acute traumatic injuries.

d. The cost of musculoskeletal disorders, based on lost earnings and worker compensation payments, exceeds that of any single health disorder. Back problems alone cost American industry an estimated 16 billion dollars per year.

e. Musculoskeletal disorders, such as inflammed joints or sprains/strains, account for one-third of annual worker compensation claims. Sprains and strains are most prevalent, with the back accounting for almost 50 percent of such disorders, followed by disorders of the ankle, knee, and shoulder.

f. The frequency and impact of musculoskeletal conditions on the work force are expected to increase over the next several decades as the average age of the work force increases.

2. The projected increase in musculoskeletal disorders is already evident despite the move towards more sophisticated automation and the shift toward non-physical work.

a. The new technology has increased the incidence of such ergonomic problems as chronic repetitive motion and static and constrained postures. (See Appendix A for available strategies to address these ergonomic problems.)

b. The introduction of modern office technology designed to reduce has generated new and pervasive sources of biomechanical stress to the musculoskeletal system.

G. Technical Assistance. In response to this situation,the agency has decided to implement a measured response.

1. National Office Ergonomist. An ergonomist has been assigned to the staff of the Director of Technical Support. He shall serve as agency expert on all ergonomic issues.

2. Regional Office Ergonomist. Regional Administrators shall appoint a Regional coordinator for ergonomic matters within the Regional technical support staff. This staff person shall serve as the Regional contact on ergonomics matters and shall disseminate relevant ergonomic material to the Area Offices and provide technical assistance to the State designees in the Region.

3. Area Office Outreach Element. The Regional Administrator shall ensure that each Area Director:

a. Includes an ergonomic sector in the Area Office Outreach Program Plan, developed in accordance with the Field Operations Manual (FOM), Chapter I, F.

b. Receives the support necessary to maintain local ergonomic programs.

c. Handles such programs in accordance with the guidelines for full-service activities as found in the FOM.

4. 7(c) (1) Consultation Project Ergonomist. The Regional Administrator shall ensure that a contact for ergonomic matters is identified in each consultation program office. This person shall serve as the programs specialist on ergonomics and as liaison with the Regional Office ergonomist.

H. Training and Education of OSHA Personnel. It is essential that an adequate number of CSHOs and consultants be trained in the ergonomic method to recognize and deal with workplace ergonomic hazards.

1. The OSHA Institute currently offers a course which specifically deals with the major topics of ergonomics, including repetitive motion disorders, manual lifting and back injuries, vibration, temperature stress and work station design. Additionally the Institute will shortly offer a separate course devoted to the
problem of workplace back injuries.

2. Each Area Director shall plan for the training in ergonomics of at least one safety and one health CSHO to investigate ergonomically related complaints or to inspect workplaces likely to have high incidences of ergonomic injury or illnesses and to serve as Area Office resource person. Such training shall be completed as soon as resources allow. Upon completion of this training, the Area Director shall inform the Regional Administrator and shall submit the names of the trained persons.

3. As resources permit, each consultation program manager shall ensure that at least one safety and one health consultant receive training in ergonomics. One of these individuals shall be the program's ergonomic contact.

4. The Director of Technical Support shall make the Directorate ergonomist available as far as resources permit when needed to assist with Regional and State training. Such needs shall be coordinated with the Director of Technical Support through the Director of Field Operations.

5. Each Area Director shall attempt to maintain an ergonomics section in the Area Office technical library.

I. Enforcement. In the course of conducting general schedule inspections, CSHO's shall be alert for high incidences of ergonomic disorders listed on the OSHA-200 Log. Additionally, employees may complain of musculoskeletal problems associated with specific tasks, and Area Offices may receive formal complaints pertaining to ergonomic matters.

1. Citations for 5(a) (1) ergonomic violations shall be processed and pre-citation review conducted in accordance with the provisions of the FOM, Chapter IV, A. 2.

2. A log of all ergonomic cases addressed in the field noting the hazard found and the steps taken by OSHA to address the hazard shall be kept by the Regional ergonomic coordinator. A Regional summary report shall be forwarded by the end of the first month after the end of a fiscal quarter to the Director of Technical Support through the Director of Field Operations.

J. Onsite Consultations. The Consultation program Manager shall ensure that in all onsite consultations involving ergonomic matters, employers are advised of good practices and possible OSHA requirements. A log of ergonomic cases without the employer's name shall be sent periodically to the Regional ergonomic coordinator.

APPENDIX A

A. Causes of Musculoskeletal Disorders

1. Although debate continues as to the causes of occupational musculoskeletal disorders, it is generally accepted that chronic exposure to physical stress serves to accelerate or aggravate the onset and course of musculoskeletal disorders.

a. The sources of the physical stress can often be traced to ordinary work activities that include repetitive or sustained lifting, bending, twisting, reaching, gripping, pinching,rubbing, kneeling and squatting.

b. When the job demands inherent in these activities repeatedly exceed the biomechanical capacity of the worker, the activities become trauma-inducing.

2. Recognition of the stressful nature of these activities has a practical, problem-solving focus.

a. Recommended interventions for reducing musculoskeletal disorders should involve an engineering approach; i. e. , redesigning the work process or tool to impose less biomechanical stress.

b. In the absence of complete information on causes, assumptions can reasonably be based on biomechanical models of physical trauma. When these assumptions are made, answers to problems are tested by judging both their feasibility and effectiveness.

c. Information is already available from ergonomics and allied fields to suggest that a majority of the biomechanical hazards responsible for occupational musculoskeletal disorders could be eliminated if feasible engineering solutions were put into practice.

B. Intervention Strategies to Reduce the Incidence of Musculoskeletal Disorders at the Work Place.

1. Awareness Strategy. Prevention requires a knowledge of the circumstances surrounding environmental hazards as well as any predisposing biological or behavioral factors that may influence the capacity of a worker to perform the job in a safe and healthful manner.

a. For this reason the most fundamental strategy is to promote workplace education and awareness programs aimed at the maintenance of musculoskeletal health and the prevention of injuries.

b. Aspects of this strategy include education of compliance officers, workers, management, engineers and medical support personnel in identifying sources of biomechanical stress and associated musculoskeletal disorders at the workplace.

2. Intervention Strategy. Concurrent with an awareness strategy is the need to promote specific control actions. The following three-tiered intervention strategy is proposed for the prevention of musculoskeletal disorders:

a. Selection and Placement of Workers in Jobs. Worker selection and placement is a process by which a workforce is selected and maintained by application of medical criteria, and/or performance criteria.

(1)The criteria are used to identify individuals with health conditions or work capacities, such as reduced strength that would increase their risk of personal injury if assigned to a job.

(2)To prevent abuse of such placement procedures, it is necessary to identify the high-risk jobs and quantify the required job-demands. Workers are matched to jobs as a function of the specific job demands and worker capacities.

(3)This effort draws on the skills of an ergonomist for evaluating job demands. In addition, clinical experience in human physiology and performance assessment is needed for evaluating worker capacities.

b. Training of Workers to Use Safe Work Practices. Training may also be used as an intervention technique for controlling workplace injuries and illnesses.

(1)Training programs range from fundamental instruction on the proper use of tools and materials, to instructions on emergency procedures, and use of protective devices.

(2)More comprehensive training programs are being developed to prepare the worker to participate in a broader range of worksite safety and health activities.

(3)Programs designed to broaden the worker's involvement include training in hazard identification, including observing and reporting hazards, and participation in plant-wide control programs.

c. Ergonomic Redesign of Tools, Task and Work Station. The third intervention strategy uses principles of ergonomics to control workplace hazards through the redesign of work methods and tools.

(1)Ergonomics is a discipline which recognizes the physiological, anatomical, and psychological capabilities and limitations of people with respect to their work tasks, equipment used, and the job environment.

(2)The goal of ergonomics is to establish a best fit between the human and imposed job conditions to ensure and enhance worker health, safety, and comfort as well as productivity.

(3)Moreover, the "best fit" can be achieved by focusing on job and tool redesign, rather than worker training or selection.

(4)Hence, prevention is achieved with the ergonomic approach as a natural result of the worker experiencing improved work postures, reduced forces and fewer repetitions as a function of job redesign.

3. Ergonomic Approach Is Most Effective. The ergonomic approach to work place design must be recognized as the most effective and is the first choice for controlling sources of workplace stress. Administrative controls, such as employee selection and training should not be viewed as primary methods of control. There are a number of reasons for this priority.

a. First, unlike employee selection and training,which require that each new employee be evaluated and instructed and thereafter monitored to determine changes in capacity and compliance with the training procedures, jobs and tools that are ergonomically" redesigned are relatively permanent and, once implemented, do not normally require modification for each new employee.

b. Secondly, employee screening and selection techniques by nature distinguishes between those who are considered fit for the job and those who are not. Fitness for a job must be based on actual job demands which are often difficult to assess. Caution must be exercised that selection procedures are specific to the job and avoid the general criteria of selecting only the strongest or youngest workers.

c. Third, although training programs are a necessary and significant part of the intervention strategy, they requireeach new employee be instructed and thereafter monitored to determine compliance with training instructions. This can be more costly and less positive than engineering controls if used as the primary means of intervention.

**********REFER TO HAZARD ABATEMENT ABSTRACT WORKSHEET*********

OSHA Instruction CPL 2.78 CH-1

Directorate of Technical Support

Subject: Page Change for OSHA Instruction CPL 2.78, Regional Ergonomics Program.

A. Purpose. This instruction transmits a page change to OSHA Instruction CPL 2.78.

B. Scope. This instruction applies OSHA-wide.

C. Action. Remove pages 5-6 and replace them with the attached new pages. File this transmittal page after the signature page of the instruction.

D. Explanation. The processing procedure for an alleged 5(a)(1) ergonomic violation has been modified to conform with OSHA Instruction CPL 2.45A, Field Operations Manual (FOM).

OSHA Instruction CPL 2.88

July 2, 1990
Directorate Of Technical Support

Subject: Information Dissemination System for Ergonomic Inspections and Consultative Visits Resulting in Significant Benefits

A. Purpose. This instruction establishes procedures for collecting and disseminating information relative to ergonomic inspections and ergonomic consultative visits which have resulted in significant benefits to employers and their employees.

B. Scope. This instruction applies OSHA-wide.

C. Action. Regional Administrators shall ensure that the policy and procedures established in this instruction are adhered to for all ergonomic inspections and visits.

D. Federal Program Change. This instruction describes a Federal program change which affects State Programs. Each Regional Administrator shall:

1. Ensure that this instruction is promptly forwarded to each State designee, using the two-way memorandum.

2. Explain the content of this instruction to the State designee as requested.

3. Notify the State designees that they are encouraged but not required to participate in this program.

4. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing to the Regional Administrator as soon as the State's intention is known, but not later than 70 calendar days after the date of issuance (10 days for mailing and 60 days for response). This acknowledgment must include the State's intention to participate in the information dissemination system for ergonomic inspections and consultative visits resulting in significant benefits to employers and their employees.

5. Inform the State designees choosing to participate that they should coordinate procedures for submitting information to the Regional Administrators.

6. Inform the State designees that this Federal program change does not require a plan supplement.

E. Background. OSHA has initiated a program for certain ergonomic hazards. Valuable data relative to hazard identification and control are collected and placed in the case files including ergonomic solutions for specific operations. This potentially valuable information is rarely shared with employers, employees, and other interested groups. This instruction is intended to provide the mechanism for the collection and dissemination of ergonomic solutions within OSHA and to interested parties and organizations outside of OSHA.

F. Procedures. Each Regional Administrator shall be responsible for the development of brief, written summaries for selected ergonomic cases and ergonomic consultative visits and for their transmission to the Directorate of Technical Support at the National Office. All information WHICH IS A TRADE SECRET OR OTHERWISE CONFIDENTIAL must be removed from the summary report. Specific guidelines to be followed are set forth below:

1. Area Offices and Consultation Project Offices. Area Directors and Consultation Project Managers shall be adequately briefed on the goals of the project.

a. After an ergonomic inspection or visit has been completed, the Area Director or Consultation Project Manager, shall be responsible for writing a summary of the noteworthy investigations. The summary shall include the following elements:

(1) A short paragraph analyzing the hazard(s) identified,giving the apparent cause and related factors contributing to the existence of the hazard(s). Identify the related occupational health problem such as cumulative trauma disorder, hand-arm vibration exposure and lower back injury. Where appropriate, rough sketches, photographs, with explanatory detail, and/or reference to video tapes taken are encouraged;

(2)A short paragraph describing the corrective action(s) implemented by the employer. The description should include changes made in work station design, tools, material handling equipment, environment, personal protective equipment and employee retraining and job rotation. Where appropriate, provide sketches, photographs and/or videotape of the workplace after the corrective action was taken;

(3) A brief summary of significant benefits realized. Examples of such benefits are cost savings, the identification and successful solution to a unique ergonomic hazard, increased awareness of workplace safety and health, and injuries prevented or reduced by the recommended abatement methods. An estimate of cost savings should be determined based on reduced workers' compensation costs, medical services, time lost from work, and increased production, if appropriate; and

(4) The number of employees who may possibly be benefited from the abatement method(s).

b. The summary shall not be forwarded to the Regional Office until the case has been closed.

2. Regional Offices. Although Area Directors and Consultation Project Managers are responsible for writing the first draft of the summary, the Regional Administrator shall ensure that the summary sent to the National Office meets the project goals.

a. Regional Administrators shall screen the summaries received from the Area Offices and select those to be forwarded to the Director, Directorate of Technical Support for possible publication.

b. At least one summary should be forwarded by each Regional Administrator semi-annually. Those judged to have the widest interest and greatest impact on preventing injuries should be given highest preference in the selection process.

c. Regional Administrators shall begin sending summaries to the Director, Directorate of Technical Support no later than the last day of the first quarter following the publication of this instruction.

d. The Regional Administrator shall transmit the selected summaries within 20 days of receipt from the Area Offices and Consultation Project Offices.

3. National Office. The Directorate of Technical Support shall review and evaluate the summaries received from the Regions. The summaries to be published shall then be selected and forwarded to the Director, Office of Information and Consumer Affairs (OICA).

a. The Director, Directorate of Technical Support will collect, organize, and maintain a file of all summaries submitted. This file will be made available to the Director, OICA, and to other OSHA offices.

b. A minimum of one summary will be published and distributed (using an existing mailing list) bimonthly by the OICA.

4. A format for the summary page is attached to this instruction. Appendix A is a sample copy of an ERGOFACTS for your information.

5. Recipients of the summaries may use them in any way they choose. They are not copyrighted, and permission is not required to reproduce them. Users are requested, however, to credit OSHA, U.S. Department of Labor.

ERGOFACTS

U.S. DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

Meatpackers "Pulling the Paddle Bone" Create Undue Ergonomic Stress

The Problem

Several recognized ergonomic risk factors (stressors) -- repetitive motions, awkward postures, and forceful exertions -- were present in one operation present in beef packing houses. This operation involves pulling the paddle bone (part of the scapula) away from the shoulder or chuck of the animal. Several workers complained of substantial pain; thus, a video tape analysis was performed on this job. As the meat is conveyed past the workers, they hook the meat and pull it to themselves, and do minor fat trimming. They then scribe or cut around the paddle bone to separate it as much as possible from the meat. These.cuts require both pushing and pulling the knife with the blade extending from the little finger side of the hand. The workers then literally rip the meat from the bone by hooking it first with the left and then the right hand. They use their forearm to brace against the meat and continue to tear at the meat with the other hand. They then grasp the neck of the bone with one hand and pull with great force while pounding the hook into the gap between the meat and bone.

After more cuts are made to separate the bone completely the bone is discarded to a conveyor. The entire operation requires about thirty seconds to complete. The workers at these positions experienced low back pain, pain in both shoulders, and severe pain in both hands. The tasks exposed workers to ergonomic stressors that caused cumulative trauma disorders. These included repeated deviations of the wrists, shoulders, and back. High pushing and pulling forces at the hand and elbow and repeated pounding of the palm area of the hook hand were also significant stress contributors.

The Solution

The task was modified by changing it into two jobs. As the meat is conveyed by the work stations the first worker scribes the bone as before but does not attempt to separate the bone from the meat. A second worker places a circular hook over the neck of the bone and this hook is chained to the floor. As the conveyor and attached meat continues to move, the slack in the chain is taken up and the bone is pulled away from the meat mechanically. The bone is then removed from the hook and placed on another conveyor.

The Benefits

The workers on these jobs are no longer exposed to the excessive ergonomic stress previously present. The manning for the job remains essentially the same as several workers were performing the task; however, they are now free to rotate between the jobs to provide some variety and reduce their exposure to any remaining force and repetition stressors. The costs were less than $300 per work station for materials and installation. The workers all felt that the changes made their job much less demanding and at no loss of output.

ErgoFacts provides a brief summary of the results of an employer's recognition of the need for workplace safety and health assistance. In some instances these situations were recognized by enforcement officials during an inspection. Such assistance can identify and help the employer correct workplace hazards, develop or improve on effective safety and health management system, or both. Contact the OSHA office in your area for additional information on the consultation program.

RECORD ID 2493

STANDARD NUMBER Ergonomics
INFORMATION DATE 860214

ABSTRACT Ergonomic controls are suggested to resolve a postal workers complaint. The worker has ganglion cysts which are difficult to associate scientifically with repetitive motion.

INTERPRETATION Ergonomics

FEB 14, 1986

MEMORANDUM

SUBJECT: (Occupational) Complaint -- Ganglion Cyst Case

I am returning with this memo the case file regarding a complaint at the (City) Post Office. The photos and associated write-up by the CSHO are quite good, but my observations and suggestions are still compromised by my not being able to actually view the job. Still, I can offer the following:

(1) The employment of wrist supports/wraps is not recommended. Most research has suggested that they run a high risk of increasing carpal tunnel compression when worn on the job. Their best use is at night during bed rest to avoid bad wrist postures and enhance reduction of inflammation.

(2) Ganglion cysts are quite difficult to associate scientifically with repeated motions when compared to other cumulative trauma disorders such as tendinitis or carpal tunnel syndrome. The complainant further confounds the present situation with what appears to be a history of ganglions prior to this task.

(3) Perhaps overweight packages could be channeled to the lower conveyer by means of a circular slide from the top conveyer. This would require minor modification of the work station and negate the necessity of picking up parcels.

(4) The keyboard could be mounted on a gooseneck type support and repositioned for each operator's comfort/convenience. This could reduce trunk twisting as well.

(5) The physician's suggestion of a 20 pound weight limit for the operator appears somewhat arbitrary. A weight at arm's length is much more stressful than the same weight close to the body.

(6) Rotation to dissimilar tasks periodically should significantly reduce the occurrence of repetition disorders. This administrative procedure is simple and often quite effective and should be recommended.

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DOE Interpretations Guide to OSH Standards

July 1,1992

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RECORD ID 2495

STANDARD NUMBER Iodine
INFORMATION DATE 860612

ABSTRACT There are minimal health risks for operating room personnel using iodine solutions for daily disinfectant scrubbing. Hypersensitivity reactions are one possible adverse effect.

INTERPRETATION Iodine

Thank you for your letter dated May 13, inquiring if scrubbing with an iodophor disinfectant for approximately 35 minutes per day can result in adverse effects in operating room personnel.

Firstly, I want to reassure you regarding the use of iodine based soap solution. Povidine-iodine solution is an effective disinfectant used extensively in the hospital setting for several years with few documented adverse effects. Although, you did not mention the concentration of iodine in the disinfectant solution you use, most currently used povidine-iodine solutions have relatively low iodine content compared to earlier iodine solutions. Most of the iodine absorbed will be protein-bound, and any adverse effects will result from the free iodine. We were unable to find reports of adverse reactions (other than hypersensitivity reactions) to povidine-iodine after application to hands and forearms such as that which occurs in the operating room. Also, we found no reports of iodine levels in hospital personnel after such application of this agent. Provided that operating room staff have healthy skin and wash off the solution after scrubbing, absorption of iodine should be minimal.

Iodine can be absorbed after ingestion, inhalation and application to the skin and mucous membranes. Skin application infrequently causes irritation and hypersensitivity reactions. Serious reactions have been documented in burn patients and after intra-operative cavity applications. Absorption in these instances would certainly be greater than that experienced after surgical scrubbing of healthy skin.

Although , iodine solutions have more irritating effects to the skin and less residual antimicrobial activity than some of the other disinfectant solutions, it also appears to be one of the safer agents. I am including an article comparing the various properties of disinfectant agents that will provide you with further detail and an excellent bibliography.

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DOE Interpretations Guide to OSH Standards

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RECORD ID 2472

STANDARD NUMBER Lift Boats
INFORMATION DATE 860307

ABSTRACT The U.S. Coast Guard intends to classify self-elevating lift boats, similar to the (Vessel A) which capsized and sank while under tow, as inspected vessels. Since the Coast Guard has exclusive responsibility for safety aboard "inspected" vessels, OSHA would be precluded from promulgating parallel rules.

INTERPRETATION Lift Boats

MAR 7, 1986

This is an update of our January 2 response to your letter of December 17, 1985 regarding Safety Recommendation M-85-116.

After receiving those recommendations regarding the Occupational Safety and Health Administration's (OSHA) regulatory responsibility in this matter, we contacted the U.S. Coast Guard with whom we share that responsibility for establishing and enforcing maritime safety regulations. The opinion of the U.S. Coast Guard is that it is their intent to classify them as inspected vessels. Since the Coast Guard has exclusive responsibility for safety aboard "inspected" vessels, OSHA would be precluded from promulgating parallel rules.

Should the Coast Guard, for some reason, not address safety and health issues aboard these types of vessels, then OSHA would explore the promulgation of such regulations.

SOURCE LETTER

DEC 17, 1985

During the early morning hours of October 17, 1984, the (VESSEL A), a 64-foot long, self propelled lift boat, became disabled when it lost propulsion and electrical power while en route to Sabine Pass, Texas, from an offshore oil drilling platform in the Gulf of Mexico. The master radioed the U.S. Coast Guard requesting assistance, and the U.S. Coast Guard Cutter (VESSEL B) was dispatched to assist. About 0830 c.s.t., the (VESSEL B) arrived on scene, and by 0917, the cutter had the (VESSEL A) in tow bound for Sabine Pass. About 15 minutes after the tow was commenced, the (VESSEL A) suddenly rolled to starboard, capsized, and sank. All seven persons on board the (VESSEL A) were rescued by the (VESSEL B), but the vessel was not salvageable and has been declared a total loss. The loss was valued at $600,000.1/

There are approximately 150 self-elevating lift boats like the (VESSEL A) which operate in the Gulf of Mexico off the United States coast. Newer, larger lift boats may be capable of operating up to 25 miles offshore in the Gulf of Mexico and have accommodations for up to 42 workers. Lift boats are of novel design and have operating characteristics that are unlike conventional seagoing vessels. These vessels operate at sea for protracted periods of time during which many industrial workers may be exposed to serious risks. The only Federal safety regulations applicable to such vessels are contained in 46 CFR Parts 24 through 26. These regulations set forth the minimum number of life preservers, ring life buoys, and portable fire extinguishers that the vessel must carry.

The self-elevating lift boat is, in essence, a mobile industrial facility. It provides a work platform and/or living quarters for industrial workers. Workers not only are exposed to the normally encountered risks that are present in the workplace ashore, but also are vulnerable to the hazards of the sea. These workers are not trained as seamen and generally are not prepared for emergencies that are likely to occur at sea. However, no safety regulations specifically designed to protect these workers are being enforced by any Federal regulatory body.

1/ For more detailed information , read Marine Accident Report-"Capsizing of the U.S. Self-Propelled lift Boat (VESSEL A) While Under Tow of the U.S. Coast Guard Cutter (VESSEL B), Gulf of Mexico, October 17, 1984"(NTSB/MAR-85/10).

Under the Outer Continental Shelf Lands Act, the Coast Guard has the authority to promulgate safety regulations to protect industrial workers on lift boats on the outer continental shelf; however, it has not done so. Even if the Coast Guard had promulgated such regulations, they would be in effect only while the vessel was actually operating on waters over the outer continental shelf; and these vessels operate frequently in State-controlled waters.

The Occupational Safety and Health Administration (OSHA) has general statutory authority to regulate safety in the workplace throughout the United States (including State-controlled waters) and its territories and possessions. In the past, the agency has exercised regulatory authority over uninspected commercial vessels where the Coast Guard has not exercised authority. Since the Coast Guard lacks the authority to regulate these vessels under the general vessel statutes in State-controlled waters, the Safety Board believes that OSHA should establish and enforce safety regulations which set forth lifesaving and fire-fighting equipment requirements to protect industrial workers carried on uninspected lift boats that operate solely in State-controlled waters.

Therefore, the National Transportation Safety Board recommends
that the Occupational Safety and Health Administration:

> Establish and enforce safety regulations which set forth lifesaving and fire-fighting equipment requirements to protect industrial workers employed on uninspected self-elevating lift boats that operate solely on State-controlled waters. (Class II, Priority Action)(M-85-116)

The National Transportation Safety Board is an independent Federal agency with the Statutory responsibility "...to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation M-85-116 in your reply.

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DOE Interpretations Guide to OSH Standards

July 1, 1992

SECTION

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RECORD ID 1737

STANDARD NUMBER OSHA ACT 1970 5(a)(1), General Duty Clause
INFORMATION DATE 870206

ABSTRACT A memorandum providing technical information to support General Duty Clause violations. To support a citation under Section 5(a)(1), compliance officers must prove the following: the employer failed to keep the workplace free of the hazards to which employees were exposed; the hazard was recognized; the hazard was causing or was likely to cause death or serious physical harm; and there was a feasible and useful method to correct the hazard.

INTERPRETATION OSHA ACT 1970 5(a)(1), General Duty Clause

FEB 6, 1987

MEMORANDUM

SUBJECT: Technical Information to Support General Duty Clause Violations

Summary:

OSHA compliance officers (CSHOs) are often called upon to deal with situations in which overexposure to a chemical that is not regulated by OSHA under 29 CFR. Subpart Z, Toxic and Hazardous Substances, is suspected. To support a citation under Section 5(a)(1),compliance officers must prove the following:

- The employer failed to keep the workplace free of the hazards to which employees were exposed.
- The hazard was recognized.
- The hazard was causing or was likely to cause death or serious physical harm.
- There was a feasible and useful method to correct the hazard.

The purpose of this project is to develop a database of information on what constitutes employer recognition of a health hazard, in the absence of an OSHA standard for a particular substance. The universe of chemicals in question in thus all chemicals that pose potential hazards to employees in their workplaces and that have not been regulated by OSHA.

Background:

(1) There are numerous chemicals currently used in industry but not covered by OSHA standards. Many of these chemicals are believed to cause serious health hazards at certain levels of exposure.

(2) Many references are available which provide information on chemicals not covered by OSHA. The most recognized references in this area are:

- The American Conference of Governmental Industrial Hygienists Documentation of Threshold Limit Values
- International standards governing occupational exposure, as published by the International Labor Organization (ILO)
- Material Safety Data Sheets
- Internal exposure limits or guidelines established by trade or professional organizations or individual companies
- Guidelines published by the American National Standards Institute (ANSI)

- Recommendations of guidelines published in the trade literature

- Standards promulgated by State governments

(3) CSHOs are not expected to search in all the above references to document a citation under 5(a)(1). This is not feasible from the time utilization point of view. In addition, not all these references are available in every area office. Issues:

OSHA has not specific policy for citing health hazards under 5(a)(1). However, without the availability of technical support guideline, a policy alone would do very little in justifying such citations.

This is an action item in response to OSHA's Performance Plan subgoal to "Identify significant enforcement issues and develop criteria for improved case development in order to enhance opportunities for favorable legal precedent, "and to institute and coordinate internal systems used to collect, analyze, and disseminate current scientific, technological, and other pertinent programmatic dates."

Options:

(1) Conduct an information search to obtain recommendations or guidelines on limits for employee exposure to the hazardous chemicals. At minimum, use the references cited above to assess the following:

- The general availability of the recommendations or guidelines to employers (i.e., generally available or in public domain, available only to members of organizations or particular group, or for internal company use only).

- Industries to which the recommendations or guidelines apply

- Scope of coverage (i.e., covers only chemicals currently regulated by OSHA, or covers non-regulated chemicals).

Prepared a report that describes the data sources identified, their availability to employers, and their scope of coverage. Tabulate recommended exposure limits or guidelines, by sources, to permit OSHA to compare suggested or recommended limits for each chemical. This will also allow the user of the report to determine overlap among guidelines for a particular chemical, i.e., the extent of consensus about what the limits of exposure should be.

Advantages:

a. The technical data base for chemicals can be used to support 5(a)(1) citations for health hazards under current or new guidelines.

b. This information would also be useful to the agency in its efforts to update the current % tables by illustrating the extent that other limit values exist that are lower than OSHA'S limit.

Disadvantage:

a. It is estimated that as much as $60,000 in contract funds is required for the completion of this project. However, it can be done under two different task orders, $30,000 each. A review will be made after completion of the initial task to evaluate the usefulness of the content and to determine the criteria for the second task order.

Option

Advantage:

a. Savings in the contract budget

Disadvantages:

a. We will remain unable to substantiate health citations under 5(a)(1).

b. Health inspections will be incomplete and some workers should continue to be exposed to serious health hazards.

RECORD ID 1837

STANDARD NUMBER OSHA ACT 1970 5(a)(1); General Duty Clause
INFORMATION DATE 890508

ABSTRACT An interpretation regarding standards for a "cable grab" device that will not allow the free end of the wire rope to exit the hoist. Not all recognized hazards are addressed by detailed OSHA standards. Standard UL 1323-1988 SCAFFOLD HOISTS, addresses problems such as: "cable grab" devices that will not allow the free end of the wire rope to exit the hoist.

INTERPRETATION OSHA ACT 1970 5(a)(1); General Duty Clause

MAY 8, 1989

Dear Mr. H:

This is in response to your letter of March 10, 1989, addressed to Mr. W, Director, Directorate of Safety Standards, concerning a "cable grab" device that will not allow the free end of the wire rope to exit the hoist.

As you may be aware, not all recognized hazards are addressed by detailed Occupational Safety and Health Administration (OSHA) standards. OSHA sometimes relies on standards from other sources such as the Underwriters Laboratories, Inc. (UL). Standard UL 1323-1988 SCAFFOLD HOISTS, addresses problems such as: "cable grab" devices that will not allow the free end of the wire rope to exit the hoist.

To make sure we had the most up-to-date information, we contacted UL and discussed "cable grab" devices. They verified that UL 1323-1988 is the latest information and that the "cable grab" devices are addressed in section 42 (Operation Test-Hoist Run Off) which states: "While supporting 100 percent of its rated working load the hoist shall be run at its maximum speed off the end of the support tc check that the secondary brake will catch, stop, and hold the loaded hoist for two minutes."

We also contacted Mr. D's Area Office in (City, State), and inquired as to his position on putting fist grips on the free end of the hoist cables to prevent the hoist from running out. The Area Office agrees that UL 1323-1988 is the document to use for scaffold hoist compliance.

Enclosed, in part, is a copy of the UL Standard for Safety UL 1323-1988, SCAFFOLD HOISTS. For more information regarding procedures for Powered Scaffold Hoists, it is suggested you contact:

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, Illinois 60062
Telephone: (312) 272-8800

SOURCE LETTER

MAR 10, 1989

SUBJECT: OSHA Act of 1970 - Section 5(a)(1)

Dear Mr. W;

As per my telephone conversation this morning with Mr. D of the OSHA office in (City, State) office suggested that I also contact you for further information on this matter.

We are manufacturers of the (Product) Hoists. These are traction-type hoists with raise/lower contractors in high-rise applications.

Our equipment is Underwriters Laboratories (UL) classified for this specific application in this industry. UL is stating that according to UL and OSHA that we will have to incorporate a "Cable Grab" device that will not allow the free end of the wire rope to exit the hoist. I have stated to UL that (Product) suggests that to prevent the free end of the wire rope from running through the hoist that by simply putting a fist grip on this free end that the cable cannot run out. This is simple and.inexpensive to do. We do not rely on this as our primary brake. My conversation with Mr. D confirmed that this is acceptable with OSHA and it is not necessary to incorporate an additional device. I am writing to you to ask your opinion on this matter. I believe that according to section 5(a)(1) that this fist grip is acceptable and that reasonable care should be taken by the employer to advise the employee.on the proper safety needed in this application and any application.

RECORD ID 3859

STANDARD NUMBER OSHA ACT of 1970 - General Duty Clause; 1910.22(a)(1); 1910.132(a); 1910.141(a)(4); 1910.145(f)(8)(i); 1910.1030(f)(2)(i)

INFORMATION DATE 901015

ABSTRACT An interpretation letter regarding providing free hepatitis B vaccine to "at risk" employees. It is OSHA's interpretation of Section 5(a)(1) of the General Duty Clause of the OSH Act that the hepatitis B vaccine is a feasible method of preventing contraction of the disease. If United Cerebral Palsy of (State) has employees who are at occupational risk from exposure to blood or body fluids, the organization is required to protect those employees in the same manner as other employers by offering them the hepatitis B vaccine at no charge to the employee. OSHA is enforcing a number of current regulations applicable to the hazards of bloodborne disease that may apply to this situation, reference 29CFR 1910.132 (Personal Protective Equipment), 29CFR 1910.22 (Housekeeping), 29CFR 1910.141 (Sanitation), and 29CFR1910.145 (Signs and Tags).

INTERPRETATION OSHA ACT of 1970 - General Duty Clause; 1910.22(a)(1); 1910.132(a); 1910.141(a)(4); 1910.145(f)(8)(i); 1910.1030(f)(2)(i)

OCT 15, 1990

This is in response to your August 15, letter addressed to Mr. F. Your request for a variance from the Occupational Safety and Health Administration's (OSHA) requirement that the hepatitis B vaccine be provided free of charge to employees was referred to my office for response. Please accept my apology for the delay in this response.

OSHA published a proposed regulation "Occupational Exposure to Bloodborne Pathogens," in the Federal Register on May 30, 1989. The Directorate of Health Standards is currently reviewing approximately 3,000 written comments and more than 4,000 pages of transcripts from the five public hearings on the proposal. The standard is expected to be finalized by May 1991.

In the interim, OSHA is enforcing a number of current regulations applicable to the hazards of bloodborne disease. These regulations include the personal protective equipment standard (29 CFR 1910.132), the housekeeping standard (29 CFR 1910.22), the sanitation standard (29 CFR 1910.141), and the signs and tags standard (29 CFR 1910.145). Additionally, we are enforcing the General Duty Clause, Section 5(a)(1) of the Occupational Safety and Health Act of 1970 (OSH Act), which requires employers to "furnish to each of his employees a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

It is OSHA's interpretation of Section 5(a)(1) that the hepatitis B vaccine is a feasible method of preventing contraction of the disease. If United Cerebral Palsy of (State) has employees who are at occupational risk from exposure to blood or body fluids, the organization is required to protect those employees in the same manner as other employers by offering them the hepatitis B vaccine at no charge to the employee.

When the proposed rule on occupational exposure to bloodborne pathogens becomes final, the opportunity will be available for you to apply for a permanent variance under section 6(d) of the OSH Act to the Office of Variance Determination. You should be aware, however, that the granting of a variance requires an alternative which is demonstrably as safe and effective as the requirement of the regulation.

With regard to your desire to institute an "amortization contract" requiring employees to reimburse your organization should they leave your employ prior to one year, OSHA requires that the vaccine be provided at no out-of-pocket expense to the employee. To do otherwise would have the effect of creating an impediment to acceptance of the vaccine by some employees. It is conceivable, for instance, that an employee who is concerned about his or her ability to repay the cost should he or she have to leave the organization would decline the vaccine solely for financial reasons. This situation is inconsistent with OSHA's intent which is to remove, as much as possible, obstacles to the employee's acceptance of the vaccine.

SOURCE LETTERS

AUG 15, 1990

Dear Mr. F:

United Cerebral Palsy of (State) is a nonprofit human services agency that provides developmental programming for the mentally and physically handicapped persons in our area.

This agency has been providing services for over ten years, including services to persons infected with hepatitis B. Since we are licensed by the (State) Dept. of Welfare we have always requested proper waivers from DPW, and followed standardized health and safety precautions to insure the safety and well-being of our clients and staff (please refer to attached letter).

I would like to request standards interpretation and, if necessary, a variance from standards concerning provision of hepatitis vaccinations for agency staff. The reasons for my request are as follows: The cost of administering hepatitis inoculations in our area is approximately $120.00 per person. It takes six months from the first inoculation for the serum to be totally effective.

Since we are a small nonprofit agency, and as most human service agencies we suffer from extreme staff turnover due to low wages and stress at this rate of staff turnover it is fiscally impossible for us to provide all of the inoculations gratis.

We would like to have all new employees who wish to have the inoculation sign an amortization contract stating that we will provide the inoculations at no charge to them if they work for one full year. Should they leave our employ before the end of that year they will be required to pay back to the agency a percentage of the cost according to the percentage of the contract year worked (i.e. if they leave after 6 months they would reimburse the agency 50%).

JUL 20, 1990

Dear Ms. B:

Mrs. C, President of the Local United Cerebral Palsy Society referred you to me on May 29, 1990 for advice and recommendations regarding the prevention of Hepatitis B.

According to the information provided, a client entering your program has been identified as a Hepatitis B carrier.

Preventive measures including the use of universal precautions for handling blood or infected body fluids was discussed. In addition the recommendation for Hepatitis B vaccine was discussed.

Some of the people who should receive Hepatitis B vaccine are dentists, physicians, emergency medical technicians, staff, and possibly clients of nonresidential day-care programs (e.g. sheltered workshops for the developmentally disabled attended by known HBV carriers, sexual contacts, and household contacts of Hepatitis B carriers.

Although the (State) Department of Health conducts immunization clinics and provides a number of vaccines at these programs, you were advised that we do not provide Hepatitis B vaccine.

You advised me of your concern for your employees and clients and your desire to have the appropriate people immunized with Hepatitis B vaccine. In addition, you advised me that the UCP Agency had no immediate funding or resources to procure the expensive Hepatitis B vaccine. I advised you to contact the Hepatitis vaccine manufacturers to see if you could procure vaccine for the appropriate staff, volunteers, and clients at group rates or complimentary.

Considering the fact that your agency has limited funding and you provide services, with MH/MR support, to developmentally disabled citizens in (State), I advised you that I would arrange for State Health Center nurses to administer vaccine to your staff if you procured the vaccine.

You notified me the week of June 11, 1990 that you had procured the vaccine. The first immunization of a series of three immunizations was given to your staff at the (County) State Health Center on June 14, 1990.

A brief discussion of Hepatitis B was provided for your staff. Important information consent forms were reviewed and signed by each vaccine recipient.

Mrs. K, R.N., the supervising nurse at the County State Health Center located in (City), contacted me on July 5, 1990 regarding additional information for the control and prevention of Hepatitis B.

Mrs. K advised me that she and her staff had received a number of phone calls from County employees for information about Hepatitis B.

Mrs. K requested me to prepare and present an educational program about Hepatitis B for the United Cerebral Agency.

This program was presented at the (City) State Health Center on July 11, 1990.

Many questions were answered regarding the communicability of Hepatitis B and the prevention of Hepatitis B.

Hepatitis B virus which affects the liver may be found in blood and other body fluids such as semen and saliva of infected people.

Preventive measures for health care providers including staff at sheltered workshops for developmentally disabled people are:

1. Use universal precautionary measures when handling blood or body fluids.

2. Be certain to wash your hands before and after handling body fluids or excrements (personal or clients).

3. Gloves should be worn when handling body fluids or blood. Handwashing before and after gloving is advised.

4. Instruments which penetrate the skin or are contaminated with blood should be sterilized or discarded as infective waste (if disposable).

5. Hepatitis B vaccine should be given to designated at-risk people.

6. If a person is bit or has significant mucous membrane or percutaneous exposure to a suspect infected object with blood or body fluids, good first aid measures should be followed. Clean the area well with copious amounts of soap and water. Then clean with a disinfectant. Following the above, arrange for a physician evaluation to assess for prevention of local infection, tetanus, HIV infection, and Hepatitis B.

7. Sexual contact with suspect Hepatitis B infected people should be avoided or preventive measures should be taken.

Health care providers who adhere to universal precautionary measures for handling body fluids, follow good hygiene practices, are vaccinated for Hepatitis B and tetanus have optimal protection against contracting work site associated infections from blood and body fluids.

You are to be commended on your concern for your staff and clients in regards to the prevention of Hepatitis B.

Please encourage your staff to continue to use good preventive techniques as outlined in this letter and discussed at the educational program.

OSHA Instruction PUB 8-1.5

SUBJECT: Guidelines for Pressure Vessel Safety Assessment

The remainder of this compliance directive has not been included due to the number of pages it contains. Users requesting this compliance directive or further assistance may contact Federal or State OSHA offices. The DOE OSH Standards Interpretations Response Line is also a valuable resource of information and may be contacted at 1-800-292-8061, Monday - Friday, 8:00 a.m. - 4:00 p.m. EST.

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RECORD ID 92111201

STANDARD NUMBER Proposed Walking Working Surface Standard; 1910.27
INFORMATION DATE 19921112

ABSTRACT An interpretation letter regarding the applicability of the exception note at 29 CFR 1910.27 in the "Walking and Working Surfaces and Personal Protective Equipment (Fall Protection Systems); Notice of Proposed Rulemaking." The letter is in response to an inquiry about a review of a new design for a hanging manhole ladder that uses a synthetic material. The ladder would have a toe clearance of 4.5 inches and would fit into the proposed exemption. OSHA uses the general duty clause to enforce worker safety and health issues not addressed by existing OSHA standards.

INTERPRETATION Proposed Walking Working Surface Standard; 29 CFR 1910.27

November 12, 1992

Dear Mr. W:

Thank you for your inquiry of July 8, addressed to R. S., Chief of the Division of Safety Abatement Assistance, requesting an interpretation of the applicability of the exception note at 29 CFR 1910.23(c)(12) in the "Walking and Working Surfaces and Personal Protective Equipment (Fall Protection Systems); Notice of Proposed Rulemaking." Please accept our apology for the delay in responding.

The American National Standards Institute's (ANSI) A14.3-1956, Safety Code for Fixed Ladders, is the source standard for 29 CFR 1910.27, the current Occupational Safety and Health Administration (OSHA) standard on fixed ladders. There is no provision in current OSHA standards covering the construction or use of your newly designed ladder. Therefore, your ladder was reviewed with respect to the general duty clause (Section 5(a)(1)) of the Occupational Safety and Health (OSH) Act. Section 5(a)(1) requires that each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.

The toe clearances of 4.5 and 7 inches (11.4 and 17.8 cm) for permanently fixed ladders were derived from ANSI A14.3 - 1956, section 5.4. To accommodate existing ladder installations at unavoidable obstructions including structural beams, foundation walls, air ducts, water pipes, etc., the 4.5 inch (11.4 cm) clearance was included in the April 10, 1990 Notice of Proposed Rulemaking for Subpart D, Walking and Working Surfaces and Personal Protective Equipment. The aforementioned clearances, which are the same as the basis for the current standard, are applicable to existing permanent ladder installations in workplaces including manhole base ladders. Your hanging manhole base ladder, as described in your letter, would fit into the proposed exception of allowing a reduced toe clearance to 4.5 inches (11.4 cm) to better line up with the projection of the manhole steps and to provide adequate climbing space in a manhole enclosure.

To be in compliance with the proposed OSHA standard, the manhole steps used to support your ladder must be capable of supporting their maximum intended load, (see proposed rule 1910.24, "step bolts and manhole steps" for additional guidance), and the ladder must be secured in position (see proposed rule 1910.23(b), "general requirements"). Neither the current nor proposed standards address ladders made of synthetic materials. However, to be in compliance with the general duty clause of the OSH Act, ladders made of synthetic materials must be as safe as wood or metal ladders which comply with OSHA standards. Factors such deterioration of material over time, strength and durability must be given consideration.

Thank you for your interest in occupational safety and health.

If you have additional questions pertaining to proposed OSHA safety standards, please direct them to TS, Acting Director, Directorate of Safety Standards Programs.

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RECORD ID 1623

STANDARD NUMBER Static Electricity
INFORMATION DATE 870718

ABSTRACT Response to an inquiry concerning grounding of a person in a wheelchair to eliminate static electricity. Devices which may be used to achieve grounding could include boot and shoe straps, wrist straps smocks aprons, floor mats, table tops, and seat covers.

INTERPRETATION Static Electricity

JUN 18, 1987

Dear Ms. W:

This is in response to your letter of May 11 inquiring about the possible non-grounding of your wheelchair to eliminate static electricity while you, yourself, are grounded. Your letter was forwarded to the Directorate of Technical Support of the Occupational Safety and Health Administration (OSHA) for response.

Static electricity is generated when objects of dissimilar substances move relative to each other. If one of the objects is nonconductive, such as the rubber wheels on your wheelchair, the electric charge may accumulate and produce sparks. To prevent the generation of the static charges or to drain off charges generated on an object, a conductive path must be insured. While you are grounded through ground straps, all components of your wheelchair may or may not be grounded. As you know, many devices are available for employee grounding including boot and shoe straps, wrist straps, smocks, aprons, floor mats, table tops, and seat covers. While there are no grounding devices designed specifically for wheelchairs, it would not be a major problem to use a combination of the above devices to achieve grounding. It is imperative, however, that all elements of the wheelchair-employee system be grounded. Such a task should be a relatively easy one to accomplish.

RECORD ID 1626

STANDARD NUMBER Surgical Lasers
INFORMATION DATE 870603

ABSTRACT OSHA has not issued any criteria for employee use of lasers that would apply to a surgical laser program. Applicable documents would be the ANSI laser standard, ANSI Z136.1-86, and the ACGIH TLV for lasers.

INTERPRETATION Surgical Lasers

JUN 3, 1987

Dear Ms. E:

This is in response to your letter of April 27, to the Occupational Safety and Heath Administration (OSHA) inquiring about any national standards or regulations related to your soon-to-be-established surgical laser program.

OSHA is the Federal regulatory agency concerned with safety and health conditions in the workplace. To date, OSHA has not issued any regulations establishing any criteria for employee use of lasers.

An American National Standards Institute (ANSI) consensus standard, "American National Standard for the Safe Use of Lasers," ANSI Z136.1-86, has been developed under the aegis of the Laser Institute of America, 5151 Monroe Street, Toledo, Ohio 43623. The standard includes the topics of: hazard evaluation and classification, control measures, safety and training, medical surveillance, measurements, and criteria for the exposure of eyes and skin.

Suggested allowable employee threshold limit values (TLV's) for direct ocular and skin exposures to laser beams have been established by the American Conference of Governmental Industrial Hygienists (ACGIH). ACGIH also established recommendations for TLV's for viewing a diffuse reflection of a laser beam or an extended source laser.

RECORD ID D9308019

STANDARD NUMBER 29 CFR 1910
INFORMATION DATE 930917

ABSTRACT This interpretation letter addresses the acceptability of merely stating in a facility's safety and health plan that Occupational Safety and Health (OSHA) standards are being followed without providing any specific details.

It is the Department of Energy's (DOE) position that safety and health plans at its facilities shall be site-specific and that it is not sufficient to simply state in the plans that OSHA standards are being followed.

INTERPRETATION 29 CFR 1910

This interpretation is in response to your letter of August 13, 1993, asking if it is acceptable to just state in safety and health plans that OSHA's standards are being followed.

Currently, Federal OSHA does not specifically require that an employer have a single written all-inclusive safety and health plan, however a standard may have a provision that calls for certain activities and procedures to be documented, such as training, operating procedures, and inspection records. An example of this requirement can be found in the standard for operations at hazardous waste sites (1910.120). Also, it is usually required that implementing plans under these standards incorporate site-specific items or the method by which the employer is complying with the standard.

It is DOE's position that any safety and health plans or procedures developed by DOE facilities be specific to the facility and provide some related details and not merely indicate that OSHA's standards are being followed. It is therefore not sufficient to simply state that you are complying with OSHA, some indication as to how compliance is achieved is needed.

RECORD ID 2211

STANDARD NUMBER Temporary Employees
INFORMATION DATE 850228

ABSTRACT A clarification is given of responsibility issues with regard to employees hired from temporary help services. With the assumption that the employer using temporary employees will also be supervising them, the employer will be responsible for meeting certain OSHA requirements such as providing necessary and appropriate Personal Protective Equipment (PPE), exposure monitoring, and medical recordkeeping.

INTERPRETATION Temporary Employees

FEB 28, 1985

MEMORANDUM

SUBJECT: Temporary Help Supply Services

This is in response to your memorandum of November 6, 1984, requesting clarification of certain responsibility issues with regard to employees hired from temporary help services. Your questions are generally related to Chapter IV of the Field Operations Manual (FOM), page 16, subparagraph A.3.a, "Definition of Employee." The principles contained in Chapter V, F, "Multi-employer Worksites," are not usually relevant to the temporary help situation since the supply service ordinarily has no supervisory control over the workplace or over the employees themselves once they report to the utilization employer. The most important question, although not the only one, in identifying the employer of an employee is who controls the manner in which the employee performs his/her assigned work? The facts surrounding each concrete situation will differ, thereby calling for a judgment by the Area Office officials involved. The Area Director may wish to consult with the Regional Office in the event of a particularly complex or difficult factual situation. Any such decision should also have the concurrence of the Solicitor's Office.

In the light of what was said above, only tentative answers can be provided to the particular questions you posed. We suggest the following general policy for your guidance:

1. In general, the assumption is that the employer using the temporary employees will also be the employer controlling and supervising them. The utilizing employer, consequently, will be the one responsible for providing necessary and appropriate PPE to those employees as well as to all other workplace employees.

2. Since the utilizing employer is generally responsible for all employees working in the establishment, including the temporary service employees, that employer also has responsibility for observing the requirements of the standards and regulations with respect to those employees, including exposure monitoring and medical recordkeeping.

3. In the matter of medical recordkeeping OSHA has no requirement for keeping cumulative exposure records. Each utilizing employer must keep exposure records for all employees, whether hired permanently by the (Company) or obtained through a temporary help supply service. The medical access standard makes it possible for each employee to maintain his/her own cumulative record if such a record is desired.

4. There is no requirement for records to be maintained so as to follow the employee. Under both the medical access standard and under the various exposure recordkeeping standards, there is no requirement for any employer to maintain a cumulative record. It is the responsibility of the employee to maintain his/her own cumulative record if one is desired. If it becomes necessary to reconstruct an exposure record as a result of later illness, such a record can be reconstructed from the employee's employment record.

5. Citations for all safety and health hazards associated with conditions at the workplace to which employees are exposed shall be issued against the utilizing employer. Violations of standards require abatement of the violative conditions; and, since the offending condition is located within the premises of the utilizing employer, that employer is responsible for correcting those violations.

   As a general rule, citations will be issued against the temporary help employer rarely and only if correction by that employer is essential to obtain abatement of the violation of the standard or regulation.

   Citations for all safety and health hazards associated with conditions at the workplace to which employees are exposed shall be issued against the utilizing employer. Violations of standards require abatement of the violative conditions; and, since the offending condition is located within the premises of the utilizing employer, that employer is responsible for correcting those violations.

As for the question of injury and illness records, as indicated in the answers to the preceding questions, OSHA considers that the responsibility for keeping and maintaining these records belongs to the employer who controls and supervises the subject employees. This will normally be the utilizing employer in the case of temporary help employees.

In view of the exemption from the requirement to keep injury and illness records granted to temporary help services, it is no longer possible to hold them responsible for maintaining records on employees they place in temporary positions. Thus, only the utilizing employer will be required to record injuries and illnesses suffered by temporary employees in the workplace. BLS is currently in the process of revising its booklet "What Every Employer Needs to Know about OSHA Recordkeeping." Presumably the new edition will reflect this position.

Because the utilizing employer is required to maintain injury and illness records, the (Company)'s LWDI rate will not be improperly lowered; and general schedule inspections will not be avoided when the establishment accident rate warrants them.

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RECORD ID 1621

STANDARD NUMBER VDT's
INFORMATION DATE 870217

ABSTRACT OSHA has issued no required standards or guidelines for the design of office environments or video display terminals (VDT's). Standards on electrical safety, radiation exposure, and noise apply to office environments. OSHA pamphlet 3092 "Working Safety with Video Display Terminals" discusses applicable standards. NIOSH has conducted numerous studies related to VDT's.

INTERPRETATION VDT's

FEB 17, 1987

Dear Dr. S:

This is in response to your January 19, inquiry to the Occupational Safety and Health Administration (OSHA) requesting information concerning current or pending health and safety standards for the design and implementation of visual display workstations in the workplace. Your letter was forwarded to the OSHA Directorate of Technical Support for response.

OSHA has issued no required standards or guidelines for the design of office environments or video display terminals (VDT's). Existing OSHA standards on electrical safety, radiation exposure, and noise apply to all workplaces including office environments. Enclosed please find OSHA pamphlet 3092 "Working Safely with Video Display Terminals" that discusses applicable existing OSHA standards for office environments and ergonomics considerations for VDT use.

The National Institute for Occupational Safety and Health (NIOSH) has conducted numerous ergonomics and health studies on computer-based work environments, especially those with VDT's. Contact NIOSH directly for results of its programs:

National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, Ohio 45226

Recommendations for optimum VDT deployment for the safety and health of VDT users are available from trade associations such as the Computer and Business Equipment Manufacturers Association (311 First Street, N.W., Suite 500, Washington, DC 20001) and the American Electronics Association (2670 Hanover Street, Post Office Box 10045, Palo Alto, California 94303) as well as the individual VDT manufacturers themselves.

RECORD ID 2505

STANDARD NUMBER VDT's
INFORMATION DATE 860203

ABSTRACT Testing for video display units (VDU's) is under the jurisdiction of the Center of Devices and Radiological Health of the U.S. Food and Drug Administration (FDA). OSHA has issued no standards or guidelines for the design of office environments or VDU's. OSHA is in the process of producing a pamphlet called "Working Safely with Video Display Terminals," (VDT's).

INTERPRETATION VDT's

FEB 3, 1986

Dear Ms. D:

This is in response to your inquiry of January 22, requesting information concerning the possible Occupational Safety and Health process of producing a pamphlet called "Working Safely with Video Display Terminals," (VDT's).

FEB 3, 1986

Dear Ms. D:

This is in response to your inquiry of January 22, requesting information concerning possible Occupational Safety and Health Administration (OSHA) standards or guidelines for the testing of video display units (VDU's) and the determination of the quality of VDU work environments.

OSHA is the Federal regulatory agency concerned with workplace safety and health conditions. OSHA does not approve, endorse or test products of any kind. Testing for VDU's is under the jurisdiction of the Center for Devices and Radiological Health of the U.S. Food and Drug administration (FDA). I am forwarding a copy of your letter to:

Television Products Section
HFZ 312
FDA - Center for Devices and Radiological Health
8756 Georgia Avenue
Silver Spring, MD 20910

OSHA has issued no required standards or guidelines for the design of office environments or video display units. OSHA is in the process of producing a pamphlet "Working Safely with Video Display Terminals," (VDT's) that will discuss ergonomics considerations for VDT use. If you desire, I will be more than happy to send you a copy of the pamphlet when it is published.

The National Institute for Occupational Safety and Health (NIOSH) has conducted numerous ergonomics and health studies on computer-based work environments, especially those with VDT's. Contact NIOSH directly for results of its programs:

National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, OH 45226

SOURCE LETTER

(No Date)

Dear Sir:

We have received an urgent request from Dr. R. of the National Swedish Board of Occupational Safety and Health. He would like to receive as much information as possible regarding the following:

I. Are tests performed on VDU equipment? Mandatory/voluntary?

II. Are quality evaluations from the working environment point of view made on VDU equipment?

For I and II

- What guidelines are used?
- Who performs the evaluation/test?
- What are the consequences of this?

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DOE Interpretations Guide to OSH Standards

July 1,1992

RECORD ID 2107

STANDARD NUMBER Waste Anesthetic Gases
INFORMATION DATE 840924

ABSTRACT Letter concerning information on the hazards of exposure to waste anesthetic gases, particularly halothane.

INTERPRETATION Waste Anesthetic Gases

SEP 24, 1984

This is in response to your request for information on the hazards of exposure to waste anesthetic gases, particularly flurothane and its possible association with reproductive effects.

Flurothane, also known as halothane, is a commonly used anesthetic agent that is often mixed with nitrous oxide for inhalation anesthesia. Current scientific evidence obtained from human and animal studies suggest that chronic exposure to anesthetic gases increases the risk of both spontaneous abortion and congenital abnormalities in offspring among female workers and wives of male workers.

In March 1977, the National Institute for Occupational Safety and Health (NIOSH) published "Criteria for a Recommended Standard...Occupational Exposure to Waste Anesthetic Gases and Vapors" (NIOSH Publication No. 77-140). This document contained a recommendation that occupational exposure to halogenated anesthetic agents such as halothane be kept below 2 parts per million (ppm), based on the weight of the agent collected from a 45-liter air sample by charcoal adsorption over a sampling period not to exceed one hour. When used in combination with nitrous oxide, NIOSH believes that levels of halothane well below 2 ppm are achievable. By controlling the nitrous oxide concentration to 25 ppm during anesthetic administration, levels of the halogenated agent will be approximately 0.5 ppm.

OSHA currently has no standard covering halothane exposure, however, we do recognize the potential hazards associated with its use in the workplace. Anesthetic delivery systems should be equipped with scavenging devices to collect all waste gases. Exposures can be further minimized through the use of proper work practices and ventilation. NIOSH also recommends that periodic air monitoring be conducted and that a medical surveillance program be initiated in the form of preplacement and annual physical examinations. Enclosed is an except from Patty's Industrial Hygiene and Toxicology, Volume 2B, 3rd edition which briefly discusses fluorocarbon exposure hazards in the health professions. For a more detailed discussion, you may wish to read the NIOSH criteria document mentioned above; it is available for viewing.

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DOE Interpretations Guide to OSH Standards

July 1,1992

SECTION

X

NOT USED

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SECTION

Y

NOT USED

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SECTION

Z

NOT USED

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OCT 11, 1977

One of the Interagency Regulatory Liaison Group programs now being implemented is the Early Warning of Alert System. The function of the System is to quickly notify other Federal Agencies participating in the Liaison Group of newly identified health hazards or of planned or impending regulatory actions. The regulations and enforcement programs of these Agencies affect many of the same industries and are concerned with related health hazards. Early notification of hazards or regulatory actions will facilitate coordinated actions, aid in data gathering, and will help maximize protection of public and environmental health while minimizing conflicting, inconsistent or duplicative requirements placed on the regulated industry.

Each of the four participating Agencies has designated an individual to be the coordinator and primary contact person for the Alert System. For the interim, I will be the OSHA coordinator. It is the coordinator's responsibility to assure that new rulemakings or significant new findings on a hazardous substance are communicated to the other three Agencies, and that similar reports from the other Agencies are communicated to appropriate OSHA staff. It is anticipated that further coordination would be carried out by technical and program staff of each of the Agencies, with policy direction being provided by the Agency principals. The Regulatory Development Work Group, of which the coordinators are members, will act in an oversight function, maintaining a current inventory of coordinated rulemakings and "trouble-shooting" any problems that the staffs could not resolve.

Information that should be brought immediately to my attention to communicate through the Alert System would include new research challenging our knowledge of the relative toxicity of a given substance, petitions for the regulation of a substance, epidemiological findings of significantly greater occurrences of an occupational disease in a workplace, and compliance actions which could impact on the regulatory policies or programs of another Agency. Other actions which should be communicated to other Agencies routinely would include OSHA guidelines on toxic materials, program memoranda relating to health standards, and standards development projects to evaluate the adequacy of existing standards. One may choose not to participate in coordinated efforts on a given rulemaking if the problem is not relevant to OSHA's programs or because of resource limitations, but it is important that the Agencies are aware of each others actions.

Please be certain that a member of your staff is designated as a contact person for further information if your office originates the alert. That person would be identified by me to the other Agency coordinators and would be expected to assume lead responsibility in coordinating the exchange of information on these matters. Any recommendations developed by coordinated actions, such as joint hearings or investigations, should be submitted to the Assistant Secretary through my office.

If you have any further questions on this procedure or on the purpose of the program, please contact me at extension 37081 or Bob Cluck at extension 37105.

OSHA Instruction CPL 2.5

OCTOBER 30,1978

Subject: Federal Enforcement of New Standards in Approved 18(b) States Prior to State Adoption.

There has been growing concern regarding the lack of enforcement during the time between the adoption of a Federal standard and the adoption of a corresponding State standard in States with approved plans. Through FIM #74-58, State Adoption of Emergency Temporary Standards and Appropriate Federal Action, dated July 12, 1974, you were directed to enforce emergency temporary standards in approved plans until State adoption of an "at least as effective as" temporary standard. Provision for such enforcement has been included in all operational status agreements.

With many important standards, including major health standards, being adopted initially as permanent standards, there is a need to extend the policy of Federal enforcement in States with approved plans to certain new permanent standards. Future operational status agreements should allow for Federal enforcement of new permanent standards during the interim period between Federal promulgation of a standard and State adoption of an "at least as effective as" standard. Operational status agreements now in effect that cannot be interpreted to allow such Federal enforcement should be amended accordingly. You will be directed when new standards should be enforced by major health standards will fall into this category.

Interim Federal enforcement may not be carried out following an affirmative 18(e) determination, at which time the Secretary relinquishes authority for exercising concurrent jurisdiction. In order to minimize the period of time in which an approved State will not have an "at least as effective as" standard following and 18(e) determination, regulations are being drafted which will require States to adopt "at least as effective as" standards within six months of Federal promulgation. The regulations will be proposed within two months. Public comment will be requested.

OSHA Instruction CPL 2.9

OCTOBER 30, 1978

MEMORANDUM

SUBJECT: Inspections of Granted Variances

Interim procedures are hereby transmitted for follow-up inspections of granted variances.

Enclosed is a list of all variances granted under Federal OSHA, and a copy of the Fede al Register documents granting each variance. These items are being forwarded to the Area Directors so they can determine which variances fall within their jurisdiction. (It should be noted that the main listing contains only the headquarters address of the applicant, while the Federal Register document may contain additional worksites.) Variances issued for construction work would apply to present and future construction projects of that type performed by that company. Those in State with approved plans are not to be inspected by Federal compliance officers. The State should be informed of the existence of those Federal variances.

Inspections of these companies to verify compliance with the terms of the order should be included under the general schedule. At the discretion of the Area Director, these inspections may either be a complete walk around or limited to the variance. Please advise the Office of Variance Determination of the results of the inspections and forward copies of violations issued.

More comprehensive procedures, as needed, will be included in the next revision of the FOM.

OSHA Instruction CPL 2.68C

JAN 19, 1988

Subject: Notification by OSHA to the United States Employment Service of Employers Who Have Failed to Abate Serious, Willful and Repeat Violations of the OSH Act

A. Purpose. This instruction initiates a system of notification by the Occupational Safety and Health Administration (OSHA) to the United States Employment Service (USES) of employers who have failed to correct serious, willful and repeat citations after the IS day working day contest period has elapsed and the employer has not contested.

B. Scope. This instruction applies OSHA-wide.

C. Reference. 20 CFR 658.501, Administrative Provisions Governing the Job Service System: Basis for Discontinuation of Services.

D. Cancellation. OSHA Instruction CPL 2.68B, December 2,1986, is canceled.

E. Action. The Office of Special Management programs (OSMP), Division of Experimental and Special Programs, shall transmit to each Regional Office quarterly a list of all open cases involving inspections with serious, willful and repeat violations on which Failure to Abate Notices (FTA) have been issued and the employer has not contested after the 15 day working period has elapsed. The Regional Office, after reviewing the printout Information for accuracy, shall send the list to the Regional Administrator, Employment and Training Administration (ETA) according to the mailing schedule. (See Appendix A for mailing dates and Appendix B for mailing addresses. See Appendix C for sample of printout).

The USES will deny services to employers on this list until the violation has been corrected or an acceptable abatement plan has been submitted to OSHA. Normally, the violation will have been corrected or an abatement plan

OSHA Instruction CPL 2.74

Jan. 29, 1986

Subject: Hazardous Waste Activity Form, OSHA 175

A. Purpose. This instruction promulgates the Hazardous Waste Activity Form, OSHA 175, and publishes the instructions to be followed in completing the form. Its purpose is to facilitate the tracking of hazardous waste activities and reimbursable Superfund-related expenses and to provide continuing assistance to field personnel by establishing a hazardous waste site data base.

B. Scope. This instruction applies OSHA-Wide.

C. Action. Regional Administrators and Area Directors shall ensure that the OSHA 175 form is placed into use by supervisors for all significant hazardous waste activities immediately upon their completion, and that the directions appended to this instruction are followed in completing these forms.

D. Federal Program Change. This instruction describes a Federal program change. Each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Explain the technical content to the State designee, as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. States may adopt the OSHA 175 form, but are not required to do so. The States' acknowledgements should indicate their intent with regard to adoption of the OSHA 175 form.

4. States are strongly encouraged to participate in this aspect of the IMIS as it will facilitate the compilation of a national database on OSHA hazardous waste-related activity, to which the States will have direct computer access, and will eliminate the need for periodic requests for manual data searches in response to requests for information.

OSHA Instruction CPL 2.74 CH-1

February 9, 1987
Directorate of Technical Support

Subject: Hazardous Waste Activity Form, OSHA 175

A. Purpose. This instruction promulgates the Hazardous Waste Activity Form, OSHA 175, and publishes the instructions to be followed in completing the form. Its purpose is to facilitate the tracking of hazardous waste activities and reimbursable Superfund-related expenses and to provide continuing assistance to field personnel by establishing a hazardous waste site data base.

B. Scope. This instruction applies OSHA-wide.

C. Action.

1. Regional Administrators and Area Directors shall ensure that OSHA 175 form is used by Compliance Safety and Health Officers (CSHO's), and other OSHA professional staff for all significant hazardous
waste activities immediately upon their completion, and that the directions appended to this instruction are followed in completing the form.

2. Remove Page A-1 from OSHA Instruction CPL 2.74 and replace it with the attached changed page. File this page after page 2 of OSHA Instruction CPL 2.74.

D. Federal Program Change. This instruction describes a Federal program change. Each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Explain the technical content to the State designee, as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. States may adopt the OSHA 175 form, but are not required to do so. The States' acknowledgments should indicate their intent with regard to adoption of the OSHA 175 form.

4. States are strongly encouraged to participate in this aspect of the IMIS as it will facilitate the compilation of a national database on OSHA hazardous waste-related activity, to which the States will have direct computer access, and will eliminate the need for periodic requests for manual data searches in response to requests for information.

Appendix A

HAZARDOUS WASTE SITE ACTIVITY FORM, OSHA 175.

A. General. This form shall be used by Agency staff to record hazardous waste activities when Agency staff expend resources greater than two hours for any one activity.

The form must be filled out upon completion of all inspection activities, technical assistance visits, training of Agency staff, comprehensive reviews of site safety and health plans and purchases o equipment directly related to hazardous waste activities. For purposes of this form, inspection activities are to be considered complete at the time citations and proposed penalties are first issued.

Updates shall be made whenever there is new or revised information affecting the items on the form.

B. Copies. Within five working days of completion of the activity, the form shall be mailed to the Health Response Team in Salt Lake City for inclusion into the OCIS Hazardous Waste Information File.

A copy shall be forwarded to the Regional Office.

When the Regional Office is the primary OSHA office involved in the activity, Regional Office staff may directly enter the information into the OCIS computer in Salt Lake City, using a computer terminal.

A hard copy of all forms submitted (including any which supply only update information) shall be maintained by the Regional Office.

C. Instructions

Note that not all items on the form apply to every hazardous waste activity, and the letters "N/A" (not applicable) may be used wherever appropriate. At the end of these instructions, examples of completed forms are provided for further clarification.

1. NAME: Enter the name of the individual filling out the Hazardous Waste Activity Form.

2. DATE: Enter the date the form was completed, beginning with the last two digits of the calendar year followed by the numerical designations for the month and day.

3. SITE NAME AND ADDRESS: Enter the hazardous waste site name (or other relevant identifier) for the activity. If the site is a Superfund or proposed Superfund site, use the site name listed in the National Priorities List (EPA's publication HW-7.2 dated October 1984, or the latest update). Enter the street (or highway) address, city, state abbreviation, and zip code of the site name involved in the activity.

4. ESTABLISHMENT NAME AND ADDRESS: Enter the correct legal name of the establishment or contractor involved in the activity. If an OSHA-1 was prepared, the entry should be the same as entry #8 on the OSHA-1 (see ADM 1-1.12A). Enter the street (or highway) address, city, state abbreviation, and zip code of the establishment involved in the activity.

5. SIC CODE: Enter the four-digit Standard Industrial Classification (SIC) code from the SIC Manual, 1972 edition.

6. SUPERFUND: Indicate whether the activity involves a Superfund or non-Superfund site or activity by entering a check in the appropriate box.

7. TYPE OF SITE: Using 60 characters or less, enter the type of site, the activity involved, (e.g., old country landfill or transformer disposal on company property).

8. PRINCIPLE CONTAMINANTS: Enter the principal chemical compounds that may be present at the site and the source of that information (e.g., county records, company representative, etc.). Separate chemical names by semicolons.

Association for Information and Image Management
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

2 of 5

9. PRIMARY OSHA OFFICE: Enter the Region number and the name of the principal office involved in the activity. If just regional Office staff are involved in the specific activity, enter "N/A" after "Area or District Office or State Name."

10. a. ON-SITE COORDINATOR: Enter the name and phone number or the individual identified as the lead Agency person in charge, such as the On-Scene Coordinator (the title "On-Scene Coordinator" is usually reserved for a lead individual on Superfund sites, usually a representative of the Environmental Protection Agency or the Coast Guard.)

b. ORGANIZATION: Enter the Agency name that have primary responsibility for site coordination and activity (see #10 a., above).

11. LOCAL OSHA CONTACT: Enter the name and office phone number (note if FTS) of the Agency individual primarily involved in the activity who could be contacted for more information. If the name of the individual is the same as the person filling out the form, enter a "1."

12. OTHER OSHA ORGANIZATIONS INVOLVED: Enter the office name of other Agency staff significantly involved in the specific activity (e.g., Health Response Team, Regional Office or Salt Lake City Laboratory). If no other office was involved enter "N/A."

13. PERIOD OF ACTIVITY: Enter the starting and completion dates of the activity, beginning with the last two digits of the calendar year, followed by the number of the month and then the day(e.g.,85 06 10 for June 10, 1985).

14. CONTACT: Enter the name and office phone number (note if FTS) of the Agency staff significantly involved in the activity as identified in #12. If #12 has an "N/A" leave this space blank.

15. UPDATE: Indicate whether this form is an update to a previous form or a new entry. If the information is an update to a previous form, enter only the site and establishment names (or other identifiers) and the updating information.

16. TYPE OF ACTIVITY: Indicate the type of activity that has been accomplished. If the activity falls under two areas, such as a technical visit and a site plan reviews submit two separate forms (individual forms must be used to record the different activities being tracked). When the activity is approved training, always report this as a Superfund-related action.

17. EMPLOYEE INFORMATION: On the first line enter the number of employees covered by the activity. If the activity is an inspection, this number is the same as #27 on the OSHA-1 form (see ADM 1-1.12A). On the second line enter the number of employees employed by the establishment working on cleaning up the site. If the activity is an inspection, this number is the same as #26 on the OSHA-1 form. On the third line enter the number of employees controlled by the employer at this site and all other domestic locations. If the activity is an inspection, this number is the same as #28 on the OSHA-1 form.

18. TYPE OF RESPONSE: Indicate the type of response necessary to perform the activity. Only one entry should be made for each of the columns "a", "b", and "d" as appropriate. In column "c" two
entries will be necessary, if the activity was classified as providing technical assistance. (If the activity was an inspection, only one entry should be made for either "Partial" or"Comprehensive.")

19. PRINCIPAL CITATIONS: When an inspection results in the issuance of citations, enter the specific Code of Federal Regulations number cited, followed by the general subject area of the citations. If additional room is necessary, enter the additional material on theback side of the form labeled "Review Comments."

20. EXPENDED RESOURCES

a. COST CENTER: Enter the appropriate three digit cost center number.

If the activity was Superfund-related, use the cost center number 037, consistent with OSHA Notice FIN 20. Since, under current policy, EPA can reimburse OSHA only for work directly related to Superfund technical assistance requests, no charges shall be submitted to cost center 037 for any non-Superfund activities or for travel costs associated with Superfund enforcement actions. These costs shall instead be charged to your office's assigned cost center. EPA reimbursement is not available for any State activity on Superfund sites.

Reimburseable items to be reported under cost center 037 (i.e., only Superfund-related expenditures) included but are not limited to:

-- travel costs for taking EPA's Hazardous Materials Incident Response Operations Training Course;

-- all travel exclusively undertaken to perform Superfund site technical assistance investigations; and,

-- any supplies or equipment specifically purchased to fulfill OSHA's obligations in providing technical assistance and/or enforcement at Superfund sites.

b. TOTAL PERSONNEL HOURS: Enter the total number of hours that all non-clerical staff spent on the specific activity, including time spent on travel. If the activity does not involve a site visit or inspection, enter the time after the heading labeled "PRESITE" (record the time in half-hour increments as noted in ADM 1-1.12A for the OSHA-31 (F) form).

c. DIRECT COSTS: Enter the number of dollars spent on equipment or travel for the activity. "Equipment costs" refers to equipment purchased by the office for the particular activity described. "EXPENDABLE EQUIPMENT" is equipment that can only be used once (e.g., disposable protective suits, gloves or detector tubes). NON-EXPENDABLE EQUIPMENT" is all other equipment. Travel costs should reflect the total costs of travel, including the costs of airline tickets.

(NO COST INFORMATION IS REQUIRED FOR ANY NON-SUPERFUND ENFORCEMENT ACTIVITIES.)

21. ABSTRACT: Using 700 characters or less, prepare a brief paragraph to include a description of the site, condition of the grounds and containers, specific activities performed for this submission and the PPE and equipment utilized by the OSHA personnel. If the activity involves a site visit, describe the results of the visit (i.e. air samples taken and citations issued or recommendations made). If the activity does not involve a site visit, briefly describe the type of activity or assistance performed. In the event the form is being completed for the purpose of tracking training activities, this entry should include the name(s) and office address(es) of the person(s) receiving the training, their specialty (health or safety), and the nature and location of the training. If the form is being used to track equipment purchases, list the equipment purchased and the individual cost for each item.

22. REFERENCES:

a. OSHA INSPECTION NUMBER AND REPORTING I.D. NUMBER: If an inspection was made, enter the pre-printed inspection number and the Reporting I.D. number from the OSHA-1 form.

b. SITE SAFETY PLAN: Indicate whether a copy of the Site Safety Plan for an individual site was obtained, and if so, indicate its location (Regional or Area Office) and the name and affiliation of the preparer.

c. OTHER DOCUMENTS: Enter the title, source and location of other significant documents that members of the Agency acquired during the course of the activity. Other documents may include reports such as contractor or employer air monitoring results or other governmental reports from EPA or the Coast Guard. It is especially important to enter information for those documents that may be useful to other CSHO's conducting similar inspections.

EXAMPLE OF HOW TO FILL OUT THE HAZARDOUS WASTE ACTIVITY
FORM FOR TRAINING EXPENSES

*** NOTE: The following entries are all that need to be made when completing this form to track training expenses.

1. NAME: Cindy Superfund

2. Date: 85/06/23

6. SUPERFUND: YES

9. PRIMARY OSHA OFFICE:
a. REGION NUMBER: 10
b. AREA OR DISTRICT OFFICE NAME: Boise Area Office

14. PERIOD OF ACTIVITY COVERED BY THIS FORM: 83/03/06 - 83/03/11

16. TYPE OF ACTIVITY: Training

20. a. COST CENTER: 037
b. ONSITE: 56 hours
c. TRAVEL: $845.00

21. ABSTRACT: Cindy Superfund (Health)

EXAMPLE OF HOW TO FILL OUT THE HAZARDOUS WASTE FORM
FOR THE PURCHASE OF EQUIPMENT
RELATED TO SUPERFUND ACTIVITIES

*** NOTE: The following entries are all that need to be made when completing this form for the purpose of tracking equipment purchases related to Superfund activities.

1. NAME: John Doe

2. DATE: 85/03/15

6. SUPERFUND: YES

9. PRIMARY OSHA OFFICE:
a. REGION NUMBER: 10
b. AREA OR DISTRICT OFFICE NAME: Boise Area Office

16. TYPE OF ACTIVITY: Equipment Purchase

20. a. COST CENTER: 037
c. NON-EXPENDABLE EQUIPMENT: $16,000.00

21. ABSTRACT: HNu meter $ 5,000; Miran 1-B $11,000

EXAMPLE OF HOW TO FILL OUT THE HAZARDOUS WASTE
ACTIVITY FORM FOR REQUESTED TECHNICAL ASSISTANCE

*** NOTE: The following entries are all that need to be made when completing this form for the purpose of tracking technical assistance related activities.

1. NAME: Jane Doe

2. DATE: 83/11/21

3. SITE NAME AND ADDRESS: Hooker (Hyde Park)
Niagara Falls, NY

6. SUPERFUND: YES

9. PRIMARY OSHA OFFICE:
a. REGION NUMBER: 2
b. AREA OR DISTRICT OFFICE NAME: N/A

14. PERIOD OF ACTIVITY COVERED BY THIS FORM: 83/11/14 - 83/11/17

16. TYPE OF ACTIVITY: Technical Assistance Visit

18.
a. TYPE OF RESPONSE: Health & Safety
b. N/A
c. Technical Assistance
d. EPA-Requested

20.
a. COST CENTER: 037
b. PRESITE: 40 hours
ONSITE: 32 hours
POSTSITE: 40 hours
c. TRAVEL: $1083.00

21. ABSTRACT: Include a brief description of the activity performed, example -- participated in a comprehensive review of the site safety and health plan. This included an onsite visit and three 2-day meetings.

HAZARDOUS WASTE ACTIVITY FORM
U.S DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH
ADMINISTRATION

---

1. Name
2. Date (yy/mm/dd)

---

3. Site name and Address
4. Establishment name and address
(City, State, Zip Code)

---

5. SIC Code
6. Superfund Yes/No
7. Type of Site

---

8. Principal Contaminants

---

9. Primary OSHA Office
10. Region #
10a. On-Site Coordinator Telephone
Area or District Office or State Name

---

11. Local OSHA Contact
a. Telephone
b. Organization

---

12. OSHA Organizations Involved
13. Period of activity covered by this form (yy/mm/dd)
Start Date - End Date

---

14. Contact Telephone
15. Is this an update from a previous entry? yes/no

---

16. Type of Activity
17. Employee Information Inspection - Equip. purchase
# of Employees covered by this Technical Visit - Training Activity?
Site Plan review - Other
# of Employees in establishment?
# of Employees controlled byemployer?

---

18. Type of Response
a. Health
b. Complaint
c. Partial
d. EPA Requested
Safety
General Schedule
Comprehensive
Not EPA Requested
Health\Safety Referral
Technical Assis. Federal Agency
Special Emphasis

---

19 Principal Citations
Type
Proposed Penalty

20. Expended Resources
a. Cost Center (3 digits)
b. Total Personnel Hours
c. Direct Costs
Pre-Site
Onsite
Post-Site
Expendable Equipment
Non-Expendable Equipment
Travel
Other

21. ABSTRACT (include a brief description for appropriate categories)
1) Site description including grounds, contaminants, and containers
2)Activities performed by OSHA
3) PPE and equipment utilized by employees and by OSHA
4) Results
5) Other

22. REFERENCES

a. OSHA Inspection Number
Reporting I.D. Number

b. Site Safety Plan Yes/No
Location
Preparer

c. Other Documents (including Title, Source, and Location.)

FOR FILE MANAGER USE ONLY

Record I.D.
Record Type
Status

Input Date
Related Record I.D. Numbers

Technical Review Date
Reviewer

Editorial Review Date
Reviewer

Review Comments

OSHA Instruction CPL 2.76

March 23, 1987
Directorate of Technical Support

Subject: Maintenance Procedure for the Hazard Abatement File

A. Purpose. This instruction establishes maintenance procedures for the Hazard Abatement File (HAF) of the Occupational Safety and Health Administration's Computerized Information System (OCIS), promulgates the Hazard Abatement Abstract Worksheet (OSHA Form 176), and publishes instructions to be followed in completing the form.

B. Scope. This instruction applies OSHA-wide.

C. Action. OSHA National Office Directors, Regional Administrators, and Area Directors shall ensure that the operation and maintenance of the HAF are carried out as outlined in this instruction.

D. Federal Program Change. This instruction describes a Federal program change to which no State response is required. However, each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Explain the content of this instruction to the State designee as requested.

3. Inform the States that they can participate by providing information for inclusion into the HAF and that the information stored in the HAF is available for their use.

4. Request the State designee to advise the Regional Administrator within 30 days of receipt of this instruction whether the State desires to participate in the information system. If a State chooses to participate, arrangements should then be made between the State and Region to facilitate such participation that is in accordance with the procedures in this instruction.

E. State Consultation Projects.

1. Regional Administrators shall forward a copy of this instruction to each Consultation Project Manager and explain the content if requested.

2. The system is designed such that the Consultation Project Managers can participate in the operation and maintenance of the HAF by providing information for inclusion into the HAF and by using the information stored in it in accordance with the procedures in this instruction.

F. Procedures and Responsibilities. Data from 7(c)(1) project case files, private consultant reports, expert testimony, technical journal articles, NIOSH investigation reports, and inspection case files, which address the feasibility of compliance with OSHA or consensus standards, or present new hazard control methods which enhance the ability of compliance and consultation personnel to assist in hazard elimination or control and WHICH ARE NOT TRADE SECRETS OR OTHERWISE CONFIDENTIAL shall be included in the HAF in accordance with the procedures below.

1. National Office. Directors shall ensure that a mechanism is established whereby useful hazard abatement information relevant to any field or Federal Agency Programs activity is identified, summarized on the Hazard Abatement Abstract Worksheet (Appendix A) and forwarded to the Directorate of Technical Support for inclusion into the HAF.

2. Regional Offices. Each Regional Administrator shall ensure that a mechanism is established for identifying and processing useful hazard abatement information located in the Regional Offices, Area Offices and Consultation Project Offices, and that such information is reviewed by an experienced safety and health professional (in either the Regional, or Consultation Project Offices) for accuracy and sufficiency of information and handled as described below:

a. All expert testimonies and private consultant reports related to any OSHA case files or consultation project case files shall be forwarded to the Directorate of Technical Support in Washington, D.C. through the Directorate of Field Operations for review, abstraction and entry into the computer.

b. Inspection case files or consultation project case files selected for HAF other than a. above shall be abstracted using the Hazard Abatement Abstract Worksheet, OSHA Form 176, as shown in Appendix A. OSHA Form 176 completed by

Area Offices staff shall be forwarded to their Regional Offices for processing as described in c. and d. below. For 7(c)(1) case file, all employer identifiers shall be deleted.

c. The Regional Office shall send by certified mail the completed OSHA Form 176 with the employer release letter (Appendix B.) to the establishment.

d. If concurrence is received from the employer, or ten (10) working days have lapsed after the employer's acknowledgment of receiving the release letter, whichever is sooner, abstracts shall be submitted to the OCIS HAF using one of the following:

(1) Electronically.

(a) Create new records on ALTOS or DECMATE using the standard form which can be downloaded from the SLCAL VAX.

(b) Upload completed records to the SLCAL VAX using error-free communication options on the ALTOS or DECMATE.

(2) Manually.

(a) Forward the form and any supplemental information to the Directorate of Technical Support through the Directorate of Field Operations.

e. Copies of all abstracts and other materials and documents, except expert testimonies and private consultant reports that must be forwarded to the National Office's Directorate of Technical Support, shall be addressed to the SLCAL unless otherwise informed.

3. Area Offices/Consultation Project Offices. Each Area Director/Consultation Project Manager shall follow the procedures established by the Region for identifying and processing information for the HAF.

4. Directorate of Technical Support. The Director of Technical Support shall ensure that the HAF is properly maintained and provides useful information as follows:

a. Abstract and enter into the computer all expert-testimonies and consultant reports.

b. Contribute to the HAF by abstracting new technological procedures in hazard controls and by providing comprehensive hazard recognition information on industries.

c. Review the HAF periodically for field contributions and usage of the file. Provide periodic updates on the status of the HAF to the Regional Offices.

d. Provide random checking of abstracts for technical accuracy.

G. Evaluation Procedure. An evaluation of the effectiveness of the procedures described here shall be completed at the end of the first year from the effective date of the instruction to determine whether it should be continued, revised, or canceled.

1. The Regional Administrators shall submit the following information to the Directorate of Technical Support yearly from the effective date of this instruction.

a. Any special problems which arise due to the implementation of this instruction.

b. Suggestions for improving the procedures required in this instruction.

c. Suggestions for alternative methods for preserving useful hazard abatement methods and expert reports, and disseminating such information to compliance and consultation personnel.

d. Any reasons why this instruction should be canceled.

2. The Director of Technical Support shall use the following information to make a recommendation to the Assistant Secretary as to whether to continue, revise or cancel this instruction.

a. The HAF monthly usage reports constitute a prime factor in the evaluation procedure.

b. Comments from Regional Administrators.

H. Outside Request for HAF Information.

1. All requests for information from the HAF under the Freedom of Information Act (FOIA) must be handled by the office receiving the request in accordance with OSHA Instruction ADM 12-9.4B for responding to such requests.

2. When searching for information from the HAF, the entire OSHA Form 176 will be displayed on the screen. However, only hazard information, control methodology and results (D.1., D.2., E.1.,and E.2. of OSHA Form 176) should be printed in response to outside requests, including FOIA requests.

3. All responses to outside requests for HAF information shall include the following statements:

"The hazard descriptions, control methods and effectiveness of controls' expressed herein are not necessarily applicable to all similar situations and should not be regarded as OSHA recommendation for hazard recognition, evaluation, and control, nor does the mention of a company name or product constitute endorsement by OSHA."

"Abstracting information and source document information which identify establishments involved in the hazard information provided here, and opinions regarding the credibility of suggested controls, are not included in our response. Such information can only be requested from James F. Foster, Director, Office of Information and Consumer Affairs, Occupational Safety and Health Administration, Frances Perkins Building, 200 Constitution Avenue, N.W., Washington, D.C. 20210."

I. Form Stock. A supply of OSHA 176 Forms will be shipped initially to each Regional and Area Office. Regional Administrators will then be responsible for requesting additional supplies of the form as necessary. State designees and 7(c)(1) Consultation Projects that chose to participate shall request OSHA 176 Forms from the Regional Offices.

J. Form Duplication. Regional, Area, State and 7(c)(1) Consultation Project Offices are allowed to duplicate the form for their own use if necessary.

K. Background.

1. The OCIS's HAF was established several years ago. The purpose of the file is to support efforts in promoting employers', employees', and safety and health professionals' cooperation in hazard elimination or control techniques to achieve the purpose of the Act.

2. HAF is an electronic information file for storing and retrieving hazard abatement information. The information can be used to assist employers and employees in finding solutions to occupational safety and health problems.

3. The responsibility for the maintenance of HAF has been assigned to the Directorate of Technical Support. However, without a steady flow of information on significant hazard abatement methods, the file cannot be kept current and its usefulness would diminish considerably.

4. In order to enhance the quality of HAF and to broaden the spectrum of its applications, the Directorate of Technical Support is incorporating special studies on hazard recognition and control for specific industries.

5. Instructions on abstracting information for the HAF are included in Appendix A.

Hazard Abatement Abstract Worksheet, OSHA 176 Form

I. General. This form shall be used by all staff who are preparing information for entering into the Computerized Hazard Abatement File. It is preferred that the form be completed by the person who has first-hand knowledge of the hazard being addressed and the corrective action taken as soon as a determination is made that information should be included in the file. Information obtained from case files shall be submitted for inclusion into the HAF only when the case is closed. Compliance or control methods which are trade secrets or otherwise confidential, shall not be abstracted. If the compliance or control method is not a trade secret or confidential and is determined to be useful or unique, but some related information is confidential, remove the confidential information and abstract other information.

II. Instruction.

A. Abstracting Information.

1. Record Number. Will be supplied by file manager.

2. Entry Date. Date entered into the computer or date abstract last reviewed month/day/year.

3. Abstracting Organization. If abstract is entered from Regional Offices, give the Region number and city. If abstract form is sent to Salt Lake City, enter Technical Support.

NOTE: Consultation projects shall submit all Hazard Abatement Abstract Worksheets to the appropriate Regional Office for data entry or transmission to the SLCAL.

4. Abstracter ID. Abstracter initials--up to three letters.

B. Source Document Information.

1. Title. Create a title which states the resolution which the abstract addresses and enclose it in parentheses; e.g., (Noise Control of a Davenport Automatic Screw Machine, Model B).

2. Document Type. Check the appropriate box. Check other if it is a Federal Agency case file and specify as such.

3. Case File Information.

CSHO or 7(c)(1) Consultant Name. Name of the compliance officer or 7(c)(1) consultant who conducted the inspection or consultation visit.

Region No., Area Office or 7(c)(1). Regional Office number, name of the Area Office (city) or 7(c)(1) consultation project office (city and State).

FTS No./Commercial Telephone No. Telephone numbers of the Area Office or 7(c)(1) consultation project office.

Case File No., Inspection or Visit No. OSHA case file number or inspection number ID; e.g., 04 0350 L6292 123 or 100123456. Consultation projects shall identify the case file number or State Visit Report Number.

Date of Inspection or Visit. Date inspection or consultation visit started.

Inspection or Visit Category: Check the appropriate box.

Type of Inspection (Visit). Fatality, catastrophe, complaint, referral, follow-up, variance, monitoring, unprogrammed related, programmed, initial training and assistance follow-up are various types of inspections or consultation visits.

4. Private Consultant Name, Address and Telephone No.

Private Consultant Name. This block is to be completed for private consultants only. Name of the consultant used in the abatement process. If the consultant develops more than one report for OSHA, an OSHA 176 shall be prepared for each report. Only items A, B, C and D need to be completed.

Address. The name and address of the consultant's firm or organization.

Telephone No. Consultant's telephone number.

C. Establishment Information. Establishment information is not to be completed by 7(c)(1) consultation projects.

Name, Address and Telephone No.
Name. Name of the establishment from the OSHA-1.
Address. Site address of the establishment.
Telephone No. Site and corporate office telephone numbers.

Primary SIC. Firm's primary SIC code number.

Secondary SIC. Enter if firm has a secondary SIC code number.

Employees:
No. at Site. Number of employees at the site.
No. Controlled. Number of employees controlled by the employer.

Operation. Use the descriptive language of the SIC manual to state the establishment's business and describe the primary work function including processes and products.

D. Hazard Information.

1. Type. Identify the hazard for which abatement method is described in E (page A-4).

Safety. Enter point of operation, electrical, fall from elevation, explosion, fire, material handling, hazardous materials, etc. (the appropriate hazard).

Health. Enter noise (impact, continuous, or intermittent), toluene, styrene, xylene, cresol, cyanide, phenol, heat and cold stresses, ionizing radiation, nonionizing radiation, particulates, etc. (the appropriate hazard).

2. Instance (Hazard) Description. Describe the hazardous condition completely and concisely. Include in the description information such as specific equipment or machinery involved (name of manufacturer and model number), physical and environmental condition of area, location in the plant, operating procedures, work practices, processes, and inherent characteristics of equipment or material. Describe whether the hazard is a result of a human error, material failure, equipment failure, improper use of equipment, inadequate maintenance or repair, ergonomic factors, etc. Describe the level and frequency of exposure, give results of measurements or tests such as noise levels, air contaminant levels, soil type, etc. State if drawings, photos or other support material relevant to the hazardous condition are available in the Area Office or consultation project office.

3. KEY WORDS. Enter key words that are related to the hazard, for example:

   Safety--

   Electrical: Grounding, bonding, current, voltage, circuit, ground-fault, impedance, etc.;

   Material Handling: Sling, hoist, rigging, load capacity, forklift, etc.;

   Hazardous Materials: Flammable, combustible, diptank, spray painting, booth, acid, ventilation, etc.

   Health--

   Noise: Impact, continuous, intermittent, decibel, intensity, frequency, dosimeter, etc.;

   Heat and Cold Stress: Temperature, heat stroke, heat exhaustion, cramp, wind chill factor, cold, freezing, etc.;

   Chemical or Biological: Specify substance.

   (Also, enter synonymous terms and words that might be helpful in searching for the information.)

E. Control (Hazard Abatement Method).

1. Methodology. Describe the method used in the hazard abatement process. Examples are engineering control, administrative or work practice control, process modification or substitution, etc. In describing the method, give complete and concise description of the abatement method such as any modification of the room layout or its physical characteristics, specific products used to abate the hazard including brand names and suppliers. If in the opinion of an expert, or the CSHO or consultant, it is not feasible to control the hazard through engineering methods, enter such information in this item.

2. Results and Effectiveness of Control. Give the results and effectiveness of the control method. The hazard may be eliminated, reduced, or isolated. Give data such as air contaminant levels before and after the control method, decibel level of noise reduction, and cost of abatement. If the control method is found to be ineffective in controlling the hazard, enter this information.

3. Control Method Reference. State the reference. This could be a private consultant, the employer, CSHO, consultation project consultant or a consensus standard such as ANSI, ASTM, ASME, ACGIH, NFPA, etc. Name, organization, address, and telephone number of outside consultants or experts should be entered in item B (Source Document Information). If the reference is a consensus standard, give the standard identification code.

4. Credibility Code(s). Check the appropriate box. When entering into the computer, enter the number that immediately follows the result statement.

5. Comments. Enter any comments related to the hazard abatement method that is not included in the above paragraphs. If certain pertinent information is not available in the case file or private consultant report, it should be so stated in the abstract.

F. Miscellaneous Information. Enter all other miscellaneous pertinent information. Include one of the following statements:

Concurrence was received in writing and was signed by Mr./Ms. (name) on (date).

Concurrence was given on the telephone by Mr./Ms. (name) on (date) at (time).

The office did not receive a response within ten (10) working days.

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Note: OSHA Form 176 (6/86) HAZARD ABATEMENT ABSTRACT WORKSHEET was not reproduced for this guide.

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APPENDIX B

Dear Employer:

The Occupational Safety and Health Administration (OSHA) supports voluntary and cooperative efforts of employers and employees in finding solutions to safety and health problems. In this regard OSHA established a Computerized Hazard Abatement File to maintain, among other things, abstracts and summaries of effective hazard control methods observed during the course of OSHA workplace inspections. Although a major purpose of the file is to keep OSHA field personnel aware of newly developed or effective control methods, OSHA believes that sharing this information with the public will help employers and safety and health professionals design and implement employee protective measures and programs, and will increase compliance with OSHA standards. We hope that the final result of this sharing of information will be the reduction of occupationally related injuries and illnesses.

On (date) an inspection of your workplace at (address) disclosed that certain effective control measures are implemented. These control measures and the hazard descriptions are summarized on the enclosed OSHA Form 176. We request that you review the content of the form to determine if any of the information is confidential business information and should not be included in our computerized Hazard Abatement File. Please respond within ten (10) working days from the date of your receipt of the letter in writing or by telephone.

Our address and telephone number are:

(Regional Office address and telephone number)

If we do not receive your response within ten (10) working days, the information described on the enclosed forms will be included in the File. Hazard information control methodology and results (D.1., D.2., E.1 and E.2., of OSHA Form 176) will be made available to the public upon request. However, other information which identifies your establishment will not be released to the public unless specifically requested under the Freedom of Information Act and that Act requires its release.

Thank you for your contribution to the cooperative efforts to minimize workplace hazards.

OSHA Instruction CPL 2.89

APR 13, 1990

Subject: Incorporating the Family of Accident or Illness Victims into the Fatality Investigations.

A. Purpose. This instruction provides policy and procedural guidance for dealing with the families of accident or illness victims in connection with the investigations of workplace fatalities.

B. Scope. This instruction applies OSHA-wide.

C. References.

1. OSHA Instruction CPL 2.45B, June 15, 1989, the Revised Field Operations Manual (FOM), Chapter VIII, Critical Fatality/Catastrophe Investigations and Chapter XIV, Disclosure.

2. OSHA Instruction CPL 2.77, December 30, 1989, Critical Fatality/Catastrophe Investigations.

D. Action. Regional Administrators and Area Directors shall ensure that the policy and procedures described in this instruction are followed in all fatality investigations. This instruction will be incorporated into a future revision of the FOM.

E. Federal Program Changes(FPC). This instruction describes a Federal Program Change which affect State Programs. Each Regional Administrator shall:

1. Ensure that a copy of this change is promptly forwarded to each State designee, using a format consistent with the Plan Change Two-way Memorandum in Appendix F, OSHA Instruction STP 2.22A, CH-2.

2. Explain the technical content of this change to the State designee as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing to the Regional Administrator as soon as the State's intention is known, but not later than 70 calendar days after the date of issuance (10 days for mailing and 60 days for response). This acknowledgment must include (1) the State;'s intention to follow OSHA's policies and procedures described in this instruction, (2) a description of the State's alternative policy and/or procedure which is "at least as effective" as the Federal policy and/or procedure, or (3) the reasons why the change should not apply to that State.

   a. If a State intends to follow OSHA's policy described in this instruction, the State must submit either a revised version of this instruction, adapted as appropriate to reference State law, regulations and administrative structure, or a cover sheet describing how references in this instruction correspond to the State's structure. The State's acknowledgment on the Plan Change Two-way Memorandum may fulfill the plan supplement requirement if the appropriate documentation is provided.

   b. If the State adopts an alternative to Federal enforcement policies, the State's submission must identify and provide a rationale for all substantial differences from Federal policies in order for OSHA to judge whether a different State procedure is as effective as comparable Federal policy. It also must provide a general description of the policy and any plans the State has developed for implementing the change.

4. Ensure that the State designees submit State plan supplements in response to this instruction, which will be incorporated into the FOM, with the next FOM change instruction. Plan change documentation, through State FOM/OTM plan supplements, is not required to be submitted more than twice a year in response to OSHA's incorporation of Federal program changes in the FOM/OTM. If the revised manuals are issued on their target dates (April 1 and October 1), the States shall have 6 months from their issuance date to submit a plan supplement in response to the issuance of the FOM or OTM, change. If an FOM/OTM change is not issued within six months of a change directive's issuance, follow the guidelines in paragraph I.1.(3)(b) of STP 2.22A CH-3 for the State's response.

5. Advise the State designees that the Regional Administrator is available to coordinate with the State in identifying sources of training which meet the requirements in Paragraph I.

6. Review policies, instructions and guidelines issued by the State to determine that this change has been communicated to State personnel.

F. Background. The FOM contains current agency policy governing the conduct of fatality investigations. However, the FOM does not address procedures to be followed by a Compliance Officer when dealing with the surviving family of a fatal workplace accident or illness victim.

1. Currently the FOM, Chapter VIII, Fatality/Catastrophe Investigations, states that OSHA's primary objectives in conducting these investigations are to determine the causes of the accident where possible, whether violations of the standards have occurred, and what effects the violations of the standards had on the accident or illness.

2. OSHA has often obtained valuable information concerning the circumstances of the accident when the cooperation of the victim's family has been sought. The family, through an exchange of information and with a point of contact with OSHA, also has been kept apprised of the course of the investigation.

3. An exclusive focus on the technical aspects of the investigation has, in some instances, resulted in distracting due attention from the human aspects of workplace deaths (suffering, sorrow and exasperation) that the family encounters when dealing with bureaucracies in both the government and the private sector.

G. Policy. Family members of employees involved in fatal occupational accidents or illnesses shall be contacted at an early point in the investigation, given an opportunity to discuss the circumstances of the accident or illness and provided timely and accurate information at all stages of the investigation as described in this instruction.

1. It shall be OSHA policy, subject to the requirements of 29 CFR Part 70, to waive fees otherwise assessable under the Freedom of Information Act (FOIA) when providing copies of disclosable portions of the accident investigation files to surviving family members or family members representing workers totally disabled by a work accident.

H. Procedures. The procedures for conducting fatality investigations outlined in the FOM, Chapter VIII, shall be modified to incorporate the following changes:

1. As soon as practicable after initiating the investigation, the CSHO shall attempt to compile a list of all of the accident victims and their current addresses, along with the names of individual(s) listed in the employer's records as next-of-kin (family member(s)) or person(s) to contact in the event of an emergency.

2. An information letter (sample letter--Appendix A) shall be sent to the family member(s) or the person(s) listed as the emergency contact person(s) indicated on the victims' employment records within 5 working days of the time their identities have been established.

a. The issuance of this letter shall be documented on the case file diary sheet.

b. The minimum contents of this initial contact letter shall be as follows:

(1) The purpose and scope of OSHA's investigation.

(2) A brief outline of OSHA's civil enforcement process, including standards, citations, and penalty system.

(3) A request for information relevant to the investigation. This request shall include an offer to meet personally with appropriate persons to discuss any information they may have to offer.

(4) A statement offering OSHA's assistance throughout the investigation. This assistance will be at a minimum:

(a) Being informed at inspection milestones; and,

(b) The offer to meet personally to answer questions.

(c) Subject to the requirements of 29 CFR Part 70, a free copy of releasable information from the case file at the time the file is closed; i.e., after the investigation is completed and any resulting OSHA enforcement proceedings have been concluded.

c. If the next-of-kin or the emergency contact person(s) cannot be determined through the employment records or fellow-employee interviews, the Area Director shall make a reasonable effort to identify the next-of-kin through a search of police reports, hospital admission records, coroner's records, and newspapers.

d. When the additional search does not identify a family member, the case file shall be documented to reflect the search and the extent to which it was carried out.

e. If the letter is returned as undeliverable, the letter and envelope shall be put in the case file and the date of return entered in the case file.

3. The compliance officer, when taking a statement pursuant to H.2.b.(3), shall explain that the interview is confidential. The greatest sensitivity and professionalism is required for such an interview. The information received must be carefully evaluated and corroborated during the investigation.

4. Follow-up contact shall be maintained with a key family member or other contact person, when requested so that the survivors can be kept up-to-date on the status of the investigation. Such contact can be by personal visit, telephone or letter, as requested by the family member. These contacts shall be made at appropriate times; e.g., after the citation issuance, after an informal conference has been conducted, after the contest has been received, and when the case has been closed.

5. The victim's family members shall be provided a copy of all citations issued as a result of the accident investigation within 5 working days of issuance.

6. All OSHA staff are cautioned, when discussing the Freedom of Information Act (FOIA) with the family, not to mislead them about the speed with which they can obtain a copy of the disclosable information prior to closing the case file. Staff are further cautioned that the employer's rights must be protected. There should be no premature release of facts or findings during any meeting with non-OSHA personnel, before the investigation and subsequent litigation is completed.

I. Training. All employees (Area Directors, Supervisors, and CSHOs) associated with fatality investigations shall be trained to recognize and cope with "Critical Incident Stress."

1. The training shall include:

a. The definition and characteristics of a "Critical Incident";

b. The normal stress reactions experienced by employers/employees and their families and friends; and

c. How to use these concepts in an OSHA investigation to successfully complete the assignment.

NOTE: Training may be in-house, through the OSHA Training Institute when available, by contract with local law enforcement trainers or by any other source deemed appropriate by the Regional Administrator.

2. The initial training for current employees shall be completed within 6 months of the effective date of this instruction.

APPENDIX A

Family Information Letter

Dear_____:

Please accept our sincerest sympathy regarding the tragic accident that resulted in the death of (victim's name).

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor is conducting an investigation of the accident and would like to keep you informed, if you so desire, of our developments and findings.

Investigations of workplace accidents are initiated by OSHA to determine:

1. The cause of the accident.

2. Whether a violation of OSHA safety and health standards related to the accident occurred.

3. What effect the standard violation had on the occurrence of the accident.

If standards were violated, OSHA may issue citations and seek civil or criminal penalties against the employer.

If you feel that you or another family member may have information concerning this accident, please contact us so that an interview can be scheduled.

The Freedom of Information Act (FOIA) governs the release of information concerning accident investigations conducted by OSHA. OSHA does not release information from enforcement investigation files until the file is closed, that is, until the investigation has been completed and any resulting litigation is concluded. If you so desire, we will keep you informed of the progress of the investigation through copies of citations, appeal letters, results of any informal settlements and any other actions taken toward the resolution of this matter.

Once the investigation file is closed, the releasable portions of the file will be made available to you on request. OSHA's policy is to waive fees for Freedom of Information Act requests in these circumstances, subject to the requirements of 29 CFR Part 70.

OSHA Instruction CPL 2-2.19

Oct 30, 1978

MEMORANDUM

SUBJECT: Quality Control Weighing Program

After considerable effort, time, and expense, the Salt Lake City Lab has developed a good quality control weighing program for area office filter weighing. Accurate, prompt participation is a necessity from all area offices to meet legal sufficiency.

Area offices are given 10 working days to complete the weighing and return the filters. If an area office can not complete the weighing in that time period, the office shall contact the Regional Office and the Lab and so indicate. Filter weighing shall then be completed as soon as possible. The Regional Office shall initiate action when informed that filters are not being returned promptly.

If the filters have become contaminated or misplaced, the Area Office shall request a new set. Inoperative balances should be sent to the manufacturer to be repaired. Finally, when area office results deviate more than 100 ug from the theoretical, the Regional Office shall determine the cause and take corrective action.

OSHA Instruction CPL 2-2.45

September 6, 1988

SUBJECT: Systems Safety Evaluation of Operations with Catastrophic Potential

A. Purpose. This instruction provides policy and procedural guidance for systems safety in workplaces with chemical-related operations which have catastrophic potential.

B. Scope. This instruction applies OSHA-wide.

C. References.

1. OSHA Instruction CPL 2.45A, April 18, 1983, the Field Operations Manual (FOM), Chapter IV for 5(a)(1) citations, and Chapter IX for referrals.

2. OSHA Instruction ADM 1-1.12A, April 1, 1984, the Integrated Management Information System (IMIS) Forms Manual.

D. Cancellation. OSHA Notice CPL 2-2, September 28, 1987, is replaced with this instruction. This instruction contains the same information as the notice; the only change is that it will remain in effect until canceled by another instruction.

E. Action. Regional Administrators and Area Directors shall ensure that the policies and procedures explained in this instruction are implemented in scheduling and conducting inspections.

F. Federal Program Change. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this change is promptly forwarded to each State designee.

2. Explain the technical content of this change to the State designee as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, instructions and guidelines issued by the State to determine if this change has been communicated to the State program personnel.

G. Background.

1. Catastrophic releases of chemicals abroad and in the United States alerted OSHA to need for special measures to ensure the safety of workers in facilities where hazardous substances are made, used, stored or handled. OSHA conducted a special emphasis program in FY86 to test policies and procedures for comprehensive safety and health systems inspections in such workplaces. The program demonstrated that specially trained compliance officers were effective in identifying potential hazards during process safety reviews. Moreover, these inspections had an effect on other firms in the chemical industry.

2. OSHA recognizes that potentially hazardous chemical releases are not limited to chemical manufacturing operations similar to those investigated in the FY86 special emphasis programs. The precautions used there should also be implemented, as may be appropriate, in all operations in which hazardous chemicals are used, mixed, stored, or otherwise handled. OSHA will pursue policies which will encourage employers to conduct systems safety audits and will incorporate systems safety inspections into the OSHA enforcement program.

3. By incorporating systems safety inspections into the regular OSHA enforcement program, OSHA adds flexibility to its policies for averting catastrophic chemical releases. While conventional inspections focus on potential violations of standards, these inspections focus on the comprehensiveness and integrity of the overall management of systems which manufacture, use or handle hazardous chemicals. OSHA will also encourage employers to improve and to maintain the quality of safety and health systems management, and especially to implement valid self-audits of chemical related systems.

H. Procedures. The following procedures apply to all comprehensive health inspections, including programmed health inspections and expanded unprogrammed health inspections. They shall also be considered when investigating chemical related fatalities and catastrophes, complaints, alleged systems-related deficiencies- hazards, or referrals from agencies and other sources. The procedures cover two phases of the enforcement process: first, identification of establishment which will receive systems safety inspections, and second, general procedures for conducting systems safety inspections.

1. Identification of workplaces for Systems Safety Inspections.

   a. The screening procedures outlined below are based on regular OSHA referral procedures except that the referral is made by the Area Director or other reviewing management official. (See FOM, Chapter IX.) The Compliance Safety and Health officer (CSHO) is obligated to alert the Area Director or supervisor to cases the CSHO feels a referral is appropriate.

   b. These screening procedures are to be integrated into the normal inspection process. They rely on information which should be gathered in any thorough industrial hygiene inspection. Thus, the screening guide, appendix A of this notice, should be completed when the inspection is well underway after conditions in the workplace have been observed and when information about safety management systems has been verified. This may not occur until the inspection is nearly complete.

   c. Note, however, that an IMMEDIATE referral may be called for when conditions in the workplace are extremely hazardous and are likely to expose employees to catastrophic risk. This is an area where professional judgment must be exercised.

   d. The following procedures apply to all comprehensive health inspections and expanded unprogrammed health inspections:

      (1) Early in the inspection, CSHO's shall compare the employer's inventory of chemicals prepared in compliance with the Hazard Communication Standard (29 CFR 1910.1200) with the two lists of chemicals found in Appendix A. [1] In many cases, the MSDS will have to be reviewed since the required inventory may list chemicals by trade names and common names.

      NOTE: This is likely to be a time consuming process since the lists will (may) contain many chemicals outside the CSHO's past experience.

      (2) If no hazardous chemicals are found, the CHSO will continue with the planned inspection A notation should be made in the file that no chemicals listed in Appendix A Were found in the establishment in quantities

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[1] SOURCE: EPA 40 CFR Part 300, November 17, 1986, pp. 41582-41592, Appendix D, Emergency Planning and Community Right to Know Programs; Interim Final Rule and Proposed Rule Cross-Reference. Working Paper on Control of Major Hazards in Industry and prevention of Major Accidents, pp. 30-44, Appendix II and Annex IV International Labor Office General 1985 NFPA 325M. The list of hazardous chemicals was compiled from several sources: Industry, EPA, ILO, and NFPA 325M.

(3) If the inventory shows that listed chemicals are present in the workplace in amounts greater than the threshold quantities for List I or greater than 660 gallons for chemicals on List 2 (refer to Appendix A), the CSHO shall continue with the inspection, and obtain the information listed in the screening guide.

(4) If the employer has not developed an inventory of chemicals for the purpose of complying with 29 CFR 1910.1200-Hazard Communication, the CHSO will determine whether any of the chemicals found present in the workplace are listed in Appendix A.

(5) At the closing conference, the CHSO shall:

(a) Inform the employer of the potential referral,

(b) Explain the factors which will be used in evaluating the safety systems in the workplace, and

(c) Provide the employer with a copy of the Inspection Guide (Appendix C) and the list of hazardous chemicals (Appendix A). An employer letter has been supplied in Appendix E for use as a cover letter

(d) The CSHO shall encourage the employer to take necessary steps to meet inspection guidelines.

(6) The CSHO shall provide the Area Director with written results of the screening and appropriate documentation from the record.

(7) The Area Director shall determine whether a referral should be made, based on information provided in the screening survey, the inspection record (case file) and local knowledge, previous inspection history, chemical accidents or releases, etc.).

(8) If the referral will NOT be made. that decision should be explained briefly in writing, and added to the case file. Consideration will be given to the appropriateness of issuing a letter of recommendation(s) based on the information available in the case file.

(9) If the Area Director decides that a referral is indicated, a comprehensive safety systems inspection will be scheduled. The basis for the decision shall be noted in writing and added to the case file.

2. Conducting the Systems Safety Evaluation. The systems evaluation will be conducted as follows:

a. Normal opening conference procedures shall be followed. The employer will be informed of the purpose of the inspection, its likely scope and potential duration, and the reasons that the workplace was selected

b. The guidelines provided in Appendix C will be followed.

c. The inspection shall be conducted by a qualified compliance officer team, as specified in J. Inspection Personnel. (page 8).

d. The citation policy described in K. Citation Policy (page 8) will be applied. Thus, in addition to citations for violations of standards or of the general duty clause, employers may be given recommendations in writing that specify ways in which identified potential hazards can be eliminated.

3. Scope of the Systems Inspection.

   a. Professional judgment will be the primary determinant of the scope of the inspection.

   b. Inspection teams should review referral decision documentation to note items which identified the workplace as potentially hazardous--for example, a large quantity of a particular chemical, or absence of emergency plans, or lack of appropriate safety and health expertise. Such items shall be emphasized in the inspection.

   c. In large establishments, it will not be possible to conduct systems evaluation of all operations or process units. CSHO's should focus on

      potentially critical elements in the system. They may restrict physical inspection to areas where specific chemicals are manufactured, used or handled.

   d. Review of the process safety systems, emergency procedures and safety management should be comprehensive and not limited to only a single area of the establishment.

I. Trade Secrets. Particular attention shall be paid to trade secret considerations. Information requested shall be screened carefully to ensure that all potential trade secret materials are properly identified and marked. At the conclusion of the inspection all information that is not required for compliance purposes shall be returned to the company.

J. Inspection Personnel.

1. Systems evaluations may be conducted only by CSHO's who have completed OSHA's chemical process safety training. They shall be experienced CSHO's of journeyman grade.

2. Evaluation teams shall consist of at least two trained members, including both health and safety expertise.

3. Teams may include other compliance officers as long as the requirements of j.1 and J.2 above are met. This approach is recommended where problems exist which do not require chemical process expertise.

K. Citation Policy. The provisions of the FOM shall be followed in issuing citations, including general duty clause (Section 5(a)(1) citations).

1. Within the areas of primary concern, few standards have been promulgated. While some hazards may be citable under the general duty clause, other hazards shall be handled by a letter to the employer.

   a. Whenever a hazardous condition not covered by a standard is found, and the decision is made not to cite the condition under the general duty clause in accordance with the provisions found in Chapter IV of the FOM, A.2.f.(2)(b), the appropriate letter shall be sent advising the employer and the employee representatives of the hazardous condition and suggesting corrective action.

   b. Recommendations made to employers shall be noted for special attention in subsequent inspections.

L. Recording in the IMIS. The OSHA-1, Inspection Report, will be completed consistent with current instructions provided in the IMIS Manual. In addition, the CSHO shall make an entry into "Optional Information" (Item 42) as follows:

1. For inspections in which the screening guide, Appendix B, is completed enter:

   Type = N, ID = 18, Value = SCREEN.

2. For systems safety inspections which are referrals generated from a supervisory review of a completed screening guide enter:

   Type N, ID = 18, Value = SCRSYSTEM.

3. For systems safety inspections generated from activity other than those presented in L.2. above enter:

   Type N, ID = 18, Value = OTHSYSTEM.

M. Evaluation. Evaluation will focus on:

1. Resource requirements for systems evaluation.

2. Impacts of systems evaluations on systems safety in individual plants, firms and industries.

3. Reliability of targeting and screening mechanisms for systems evaluations.

N. Review and Coordination. Experience with systems evaluation indicates that it is useful to have a means of comparing classification of hazards (e.g., citations for violation of standards or general duty clause versus issuance of recommendations to the employer) across organizational lines. Further, it is necessary to facilitate sharing of technical information about chemical-related processes. To achieve these objectives, Regional administrators will:

1. Designate a coordinator for systems evaluations in each Region.

2. Submit copies of completed files to the Director of Technical Support through the Office of Field Programs for abstracting and information sharing.

3. Ensure that appropriate procedures are developed for periodic review of citations for consistency, both within and outside of the Region. Methods including timely review and use of the Directorate of Technical Support's information sharing network and incorporation of systems safety inspection review in the Area Office audit process will be of assistance in accomplishing this objective.

O. CSHO Protection. Because of the targeting nature of systems safety inspections it is important that our CSHO be familiar with a facility's existing emergency response plans. The CSHO must be able to properly identify the meaning and appropriate response to various emergency alarm systems which may exist at the site. Additionally, the CSHO must assess his/her personal protective equipment (PPE) needs (technical support staff may be of assistance with this effort). The Area Office is responsible for ensuring that appropriate protective equipment is available for use by the inspectors.

Appendix A
List 1

List of Extremely Hazardous Substances
Chemical Abstract

Chemical name	Service Number	Threshold Quantity (pounds)
Acetone cyanonhydrin	75-865	1,000
Acetone thiosemicarbazide	1752-30-3	1,000
Acrolein	107-02-8	500
Acrylamide	79-02-8	1,000
Acrylonitrile	107-13-1	10,000
Acrylyl chloride	814-68-6	500
Adiponitrile	111-69-3	1,000
Aldicarb	116-06-3	100(3)
Aldrin	309-00-2	500
Ally alcohoi	107-18-6	1,000
Allylamine	107-11-9	500
Aluminum phosphide	20859-73-8	500(4)
Aminoptenin	54-62-6	500
Amitron	78-53-5	500
Amitron oxalate	3734-97-2	100
Ammonia	7664-41-7	500
Ammonium chloroplatinate	16919-58-7(5)	10,000
Amphetamine	300-62-9	1,000
Aniline	62-53-3	1,000
Aniline. 2,4,6-trimethyl-	88-05-1	500
Antimony pentaflouride	7783-70-2	500
Antimycin A	1397-94-0	1,000
Antu	86-88-4	500
Arsenic pentoxide	1303-28-2	100
Arsenous oxide	1327-53-3	500
Arsenous trichloride	784-34-1	500
Arsine	7784-42-1	100
Azinphos-ethyl	2642-71-9	100
Azinphos-methyl	86-50-0	2
Bacitracin	1405-87-4(a)5	10,000
Benzal chloride	98-87-3	500
Benzenamine. 3-(trifluoromethyl)-	98-16-8	500
Benzene.1-(chloromethyl)-4-Nitro-	100-14-1	500
Benzenearsonic acid	98-05-5	2
Benzenesulfonly chloride	98-09-9(5)	10,000
Benzotrichloride	98-07-7	100
Benzyl chloride	100-44-7	500
Benzyl cyanide	140-29-4	1000
Bicyclo[2.2.1]heptane-2-carbonitrite, 5-chloro-6-((((methylamino) Carbonyl)oxy)-m)	15271-41-7	500
Bis(chloromethyl) ketone	534-07-6	2
Bitoscanate	4044-65-9	500
Boron trichloride	10294-34-5	500
Boron trifluoride	7637-07-2	500
Boron trifluoride compound with methyl ether (1:1)	353-42-4	1000
Bromadiolone	28772-56-7	100
Bromine	7726-95-6	500
Butadiene	106-99-0(5)	10,000
Butyl isovalerate	109-19-3(5)	10,000

Butyl vinyl ether	111-34-2(5)	10,000
C.I. basic green 1	633-03-4(5)	10,000
Cadmium oxide	1306-19-0	100
Cadmium stearate	2223-93-0	1,000(3)
Calcium arsenate	7778-44-1	500
Camphechlor	8001-35-2	500
Cantharidin	56-25-7	100
Carbachol chloride	51-83-2	500
Carbamic acid, methyl-0-(((2,4-Dimethyl-1,3-Dithiolan-2-yl)Methylene)Amino)-	26419-73-8	100
Carbofuran	1563-66-2	2
Carbon disulfide	75-15-10	10,000
Carbophenothion	786-19-6	500
Carvone	2214-16-8(5)	10,000
Chlordane	57-74-9	1,000
Chlorfenvinfos	470-90-5	500
Chlorine	7782-50-5	100
Chlormephos	24934-91-6	500
Chlormequat chloride	999-81-5	1,000
Chloroacetaldehyde	107-20-0(5)	10,000
Chloracetic acid	79-11-8	100
Chloroethanol	07-07-3	500
Chloroethyl chloroformate	627-11-2	1,000
Chloroform	67-66-3	10,000
Chloromethyl ether	542-8-1	1,000
Chloromethyl methyl ether	107-30-2	100(3)
Chlorophacinone	3691-35-8	100
Chloroxuron	1982-47-4	500
Chlorthiophos	21923-23-9	1,000
Chromic chloride	10025-73-7	2
Cobalt	7440-48-4(4)	10,000
Cobalt carbonyl	10210-68-1	100
Cobalt, ((2.2(1,2-ethanediylbis (nitrilomethylidyne)) bis(fluorophenolato)))(2)	62207-76-5	100
Colchicine	64-86-8	100
Coumafuryl	117-52-2(5)	10,000
Coumaphos	56-72-4	100
Coumatetralyl	5836-29-3	500
Cresol,o-	95-48-7	1,000
Crimidine	535-89-7	100
Crotonaldehyde	4170-30-3	1,000
Crotonaldehyde, (E)-	123-73-9	1,000
Cyanogen bromide	506-68-3	500
Cyanogen iodide	506-78-5	1,000
Cyanophos	2636-26-2	1,000
Cyanuric fluoride	675-14-9	100
Cycloheximide	66-81-9	100
Cyclohexylamine	108-91-8	10,000
Cyclopentane	287-92-3(5)	10,000
Decaborane (14)	17702-41-9	500
Demeton	8065-48-3	500
Demeton-s-methyl	919-86-8	500
Dialifos	10311-84-9	100
Diborane	19287-45-7	100
Dibutyl phthalate	84-74-2(5)	10,000
Dichlorobenzalkonium chloride	8023-53-8(5)	10,000
Dichloroethyl ether	111-44-4	10,000

Dichloromethylphenylsilane	149-74-6	1,000
Dichlorvos	62-73-7	1,000
Dicrotophos	141-66-2	100
Diepoxybutane	1464-53-5	500
Diethyl chlorophosphate	814-49-3	1,000
Diethy1-p-phenylenediamine	93-05-0(5)	10,000
Diethylcarbamazine citrate	1642-54-2	100
Digitoxin	71-63-6	100(3)
Diglycidyl ether	2238-07-5	1,000
Digoxin	20830-75-5	100
Dimefox	115-26-4	500
Dimethoate	60-51-5	500
Dimethyl phosphorochloridothioate	2524-03-0	500
Dimethyl phthalate	131-11-3(5)	10,000
Dimethyl sulfate	77-78-1	500
Dimethyl sulfide	75-18-3	100
Dimethyl-p-phenylenediamine	99-98-9	2
Dimethyldichlorosilane	75-78-5	10,000
Dimethyldrazine	51-14-7	1,000
Dimetilan	644-64-4	500
Dinitrocresol	534-52-1	2
Dinoseb	88-85-7	100
Dinoterb	1420-07-1	500
Diotyl phthalate	117-84-0(5)	10,000
Dioxathion	78-34-2	500
Dioxolane	646-06-0(5)	10,000
Diphacinone	82-66-6	2
Diphosphoramide, octamethyl-	152-16-9	100
Disulfoton	298-04-4	500
Dithiazanine iodide	514-73-8	500
Dithiobiuret	541-53-7	100
Emetine. dihydrochloride	316-42-7	1,000
Endosulfan	15-29-7	2
Endothion	2778-04-3	500
Endrin	72-20-8	500
Epichlorahydrin	06-89-8	1,000
EPN	2104-64-5	100
Ergocalciferol	50-14-6	1,000(3)
Ergotamine tartrate	379-79-3	500
Ethanesulfonyl chloride, 2-chloro-	1622-32-8	500
Ethanol, 1.2-dichloro-, acetate	10140-87-1	1,000
Ethion	563-12-2	1,000
Ethoprophos	13194-48-4	1,000
Ethyl thiocyanate	542-90-5	10,000
Ethylbis(2-chloroethyl)amine	538-07-8	10,000
Ethylene fluorohydrin	371-62-0	2(3)
Ethylene oxide	75-21-8	1,000
Ethylenediamine	07-15-3	10,000
Ethyleneimine	151-56-4	500
Ethylmercuric phosphate	2235-25-8(5)	10,000
Fenamiphos	22224-92-6	2
Fenitrothion	122-14-5	500
Fensulfothion	115-90-2	1,000
Fluenetil	4301-50-2	100
Fluorine	7782-41-4	100
Fluoroacetamide	640-19-7	2(3)
Fluoroacetic acid	144-49-0	2
Fluoroacetyl chloride	59-06-8	2(3)

Fluorouracil	51-21-8	500
Fonofus	944-22-9	500
Formaldehyde	500-00-0	500
Formaldehyde cyanohydrin	107-16-4	10,000
Formetanate	23422-53-9	100
Formothion	2540-82-1	100
Formparanate	17702-57-7	100
Fosthietan	21548-32-3	500
Fuberidazole	3878-19-1	100
Furan	110-00-9	500
Gallium trichloride	13450-90-3	500
Hexachlorocyclopentadiene	77-47-4	500
Hexachloronaphthalene	1335-87-1(5)	10,000
Hexamethylenediamine, N,N'-dibutyl	4835-11-4	500
Hydrazine	302-01-2	1,000
Hydrocyanic acid	74-90-8	100
Hydrogen chloride	7647-01-0	500
Hydrogen fluoride	7664-39-3	100
Hydrogen peroxide (concentration greater than 52%)	7722-84-1	1,000
Hydrogen selenide	7783-07-5	2
Hydrogen sulfide	7783-06-4	500
Hydroquinone	123-31-9	500
Indomethacin	53-86-1(5)	10,000
Indium tetrachloride	10025-97-5(5)	10,000
Iron, Pentacarbonyl-	13463-40-6(5)	100
Isobenzan	297-78-9	100
Isobutyronitrile	78-82-0	10,000
Isoncyanic acid, 3,4-dichlorophenyl ester	102-36-3	500
Isodrin	465-73-6	100
Isofluorphate	55-91-4	100(3)
Isophorone diisocyanate	4098-71-9	100(3)
Isopropyl chloroformate	108-23-6	1,000
Isopropyl formate	625-55-8	500
Isopropylmethylpyrazolyl dimethylcarbamate	119-38-0	500
Lactonitrile	78-97-7	1,000
Leptophos	21609-90-5	500
Lewisite	541-25-3	2(3)
Lindane	58-89-9	1,000
Lithium hydride	7580-67-8	100(b)4
Malononitrile	109-77-3	500
Manganese, tricarbonyl methylcyclopentadienyl	12108-13-3	10,000
Mechlorethamine	51-75-2	2(3)
Mephosfolan	950-10-7	500
Mercuric acetate	1600-27-7	500
Mercuric chloride	7487-94-7	500
Mercuric oxide	21908-3-2	500
Mesitylene	108-67-8(5)	10,000
Methacrolein diacetate	10476-95-6	1,000
Methacrylic anhydride	60-93-0	500
Methacrylonitrile	126-98-7	10,000
Methacryloyl chloride	920-46-7	100
Methacryloyloxyethyl isocyanate	30674-80-7	500

Methamidophos	10265-92-6	100
Methanesulfonyl fluoride	658-25-8	1,000
Methidathion	950-37-8	500
Methiocarb	2032-65-7	500
Methomyl	16752-77-5	100
Methoxyethylmercuric acetate	151-38-2	500
Methyl 2-chloroacrylate	80-63-7	500
Methyl bromide	74-83-9	1,000
Methyl chloroformate	79-22-1	10,000
Methyl disulfide	624-92-0	100
Methyl isocyanate	624-83-9	500
Methyl isothiocyanate	556-61-6	500(4)
Methyl mercaptan	74-93-1	500
Methyl phenkapton	3735-23-7	500
Methyl phosphonic dichloride	676-97-1	100(4)
Methyl thiocyanate	556-64-9	10,000
Methyl vinyl ketone	78-94-4	2
Methylhydrazine	60-34-4	500
Methylmercuric dicyanamide	502-39-6	500
Methtrichlorosilane	75-79-6	10,000
Metolcarb	1129-41-5	100
Mevinphos	7786-34-7	500
Mexacarbate	315-18-4	500
Mitomycin C	50-07-7	500
Monocrotophos	6923-22-4	2
Muscimol	2763-96-4	500
Mustard gas	505-60-2	1,000
Nickel	7440-02-0(5)	10,000
Nickel carbonyl	13463-39-3	any3
Nicotine	54-11-5	100(3)
Nicotine sulfate	65-30-5	100
Nitric acid	7697-37-2	1,000
Nitric oxide	10102-43-9	100(3)
Nitrobenzene	98-95-3	10,000
Nitrocyclohexane	1122-60-7	500
Nitrogen dioxide	10102-44-0	100
Nitrasodimethylamine	62-75-9	500
Norbormide	991-42-4	100
Organorhodium complex (PMN-82-147)		2
Orotic acid	65-86-1(5)	10,000
Osmium tetroxide	20816-12-0(5)	10,000
Ouabain	630-60-4	100(3)
Oxamyl	23135-22-0	100
Oxetane, 3,3-bis(chloromethyl)-	78-71-7	500
Oxydisulfoton	2497-07-6	1,000
Ozone	10028-15-6	100
Praquat	1910-42-5	2
Paraquat methosulate	2074-50-2	2
Parathion	56-38-2	100(3)
Parathion-methyl	298-00-0 1	100(3)
Paris green	12002-03-8	500
Pentaborane	19624-22-7	500
Pentachloroethane	76-01-7(5)	10,000
Pentachlorophenol	87-86-5(5)	10,000
Pentadecylamine	2570-26-5	100
Peracetic acid	79-21-0	500

Perchloromethylmercaptan	594-42-3	500
Phenol	108-95-2	500
Phenol, 2,2-thiobis(4,6-dichloro-	97-18-7	100
Phenol, 2,2-thiobis[4-chloro-6-methyl-	4418-66-0	100
Phenol, 3-(1-methylethyl)-, methylcarbamate	64-00-6	500
Phenoxarsine, 10,10'-oxidi-	58-36-6	500
Phenyl dichloroarsine	696-28-6	1,000
Phenylhydrazine hydrochloride	59-88-1	1,000
Phenylmercury acetate	62-38-4	500
Phenylsilatrane	2097-19-0	500
Phenthiourea	103-85-5	100
Phorate	298-02-2	2
Phosacetim	4104-14-7	100
Phosfolan	947-02-4	100
Phosgene	75-44-5	2
Phosmet	732-11-6	2
Phosphamidon	13171-21-6	100
Phosphine	7803-51-2	500
Phosphonothioic acid, methyl-,O-ethyl O-(4-(methylthio) phenyl) ester	2703-13-1	500
Phosphonothioic acid, methyl-,S-(2-bis(1-methylethyl) aminoethyl) O-ethyl ester	50782-69-9	100
Phosphonotioic acid, methyl-,O-(nitraphenyl)O-phenyl ester	2665-30-7	500
Phosphoric acid, dimethyl 4-(methylthio) phenyl ester	3254-63-5	500
Phosphorous trichloride	7719-12-2	1,000
Phosphorus	7723-14-0	500(4)
Phosphorus oxychloride	10025-87-3	500
Phosphorus pentachloride	10026-13-8	500(4)
Phosphorus pentoxide	1314-56-3	2(4)
Phylloquinone	84-80-0(5)	10,000
Physostigmine	57-47-6	100
Physostigmine, salicylate (1:1)	57-64-7	100
Picrotoxin	124-87-8	500
Piperidine	110-89-4	1,000
Piprotal	5281-13-0	100
Pirimifos-ethyl	23505-41-1	1,000
Platinous chloride	10025-65-7(5)	10,000
Platinum tetrachloride	13454-96-1(5)	10,000
Potassium arsenite	124-50-2	500
Potassium cyanide	151-50-8	100(4)
Potassium silver cyanide	506-61-6	500(4)
Promecarb	2631-37-0	1,000
Propargyl bromide	106-96-7	2
Propiolactone, beta-	57-57-8	500
Propionitrile	107-12-0	500
Propionitrile, 3-chloro-	542-76-7	1,000
Propyl chloroformate	109-61-5	500
Propylene glycol, allyl ether	1331-17-5(5)	10,000
Propylene oxide	75-56-9	10,000
Propyleneimine	75-55-8	10,000
Prothoate	2275-18-5	100
Pseudocumene	95-63-6(5)	10,000
Pyrene	129-00-0	1,00(3)
Pyridine, 2-methyl-5-vinyl-	140-76-1	500
Pyridine, 4-amino	504-24-5	100
Pyridine, 4-nitro-1-oxide	1124-33-0	500

Pyriminil	53558-25-1	1,000
Rhodium trichloride	10049-07-7(5)	10,000
Salcomine	14167-18-1	500
Sarin	107-44-8	2(3)
Selenium oxychloride	7791-23-3	500
Selenous acid	7738-00-8	1,000
Semicarbazide hydrochloride	563-41-7	1,000
Silane, (4-aminobutyl)diethoxymethyl-	3037-72-7	1,000
Sodium anthraquinone-1-sulfonate	128-56-3(5)	10,000
Sodium arsenate	7631-89-2	1,000
Sodium arsenite	7784-46-5	500
Sodium azide (Na(N3))	26626-22-8	100(43)
Sodium cacodylate	124-65-2	100
Sodium cyanide (Na(CN))	143-33-9	100(4)
Sodium fluoroacetate	62-74-8	2
Sodium pentacyhlorophenate	131-52-2	100
Sodium selenate	13410-01-0	100
Sodium selenite	10102-18-8	500
Sodium tellurite	10102-20-2	500
Strychnine	57-24-9	100(3)
Strychnine, sulfate	60-41-3	100
Sulfotep	3689-24-5	500
Solfoxide, 3-chloropropyl octyl	3569-57-1	500
Sulfur dioxide	7446-09-5	500
Sulfur tetrafluoride	7783-60-0	100
Sulfur trioxide	7446-11-9	100(4)
Sulfuric acid	7664-93-9	1,000
Tabun	77-81-6	2(3)
Tellurium	13494-80-9	500
Tellurium hexafluoride	7783-80-4	2
Tepp	107-49-3	100
Terbufos	13071-79-9	500
Tetraethyllead	78-00-2	100(3)
Tetraethyltin	597-64-8	100(3)
Tetramethyl lead	75-74-1	100(3)
Tetranitromethane	509-14-8	500
Thallic oxide	1314-32-5(5)	10,000
Thallium sulfate	10031-59-1	100
Thallous carbonate	6533-73-9	100(3)
Thallous chloride	7791-12-0	100(3)
Thallous malonate	2757-18-8	100(3)
Thallous sulfate	7446-18-6	100
Thiocarbazide	2231-57-4	1,000
Thiocyanic acid, 2-(benxothiazolythio) methyl ester	21564-17-0(5)	10,000
Thiofanox	39196-18-4	100
Thiometon	640-15-3(5) 1	10,000
Thionazin	297-97-2	500
Thiophenol	108-98-5	500
Thiosemicarbazide	79-19-6	100
Thiourea, (2-chlorophenyl)-	5344-82-1	100
Thiourea, (2-methylphenyl)-	614-78-8	500
Titanium tetrachloride	7550-45-0	100
Toluene 2,4-diisocyanate	546-84-9	500
Toluene 2,6-diisocyanate	91-08-7	100
Trans-1,4-dichlorobutene	110-57-6	500

Triamiphos	1031-47-6	500
Triazofos	24017-47-8	500
Trichloro(chloromethyl)silane	1558-25-4	100
Trichloro(dichlorophenyl)silane	27137-85-5	500
Trichloroacetyl chloride	76-02-8	500
Trichloroethylsilane	115-21-9	10,000
Trichloronate	327-98-0	1,000
Trichlorophenylsilane	98-13-5	2
Trichlorophon	52-68-6(5)	10,000
Triethoxysilane	998-30-1	500
Trimethylchlorosilane	75-77-4	1,000
Trimethylolpropane phosphite	824-11-3	500
Trimethyltin chloride	1066-45-1	500
Triphenyltin chloride	639-58-7	500
Tris(2-chloroethyl)amine	555-77-1	1,000
Valinomycin	2001-95-8	1,000(3)
Vanadium pentoxide	1314-62-1	100(4)
Vinyl acetate monomer	108-05-4	1,000
Vinylnorbornene	3048-64-4(5)	10,000
Warfarin	81-81-2	500
Warfarin sodium	129-06-6	1,000
Xylylene dichloride	28347-13-9	100
Zinc phosphide	1314-84-7	500(4)
Zinc, dichloro(4,4-dimethyl-5((((methylamino)carbonyl) oxy)imino)pentanenitrile)	58270-08-9	100

1. Statutory reportable quantity for purposes of emergency notification under SARA section 304(a)(2).

2. Indicates that the reportable quantity is subject to change when the assessment of potential carcinogenicity and/or chronic toxicity is completed.

3. The calculated threshold quantity changed after technical review as described in the text.

4. This material is a reactive solid. The threshold planning quantity will not become 10,000 pounds or the non-powder form.

5. This chemical is proposed for deletion from list. Threshold planning quantity is in the interim assigned to the category of lowest concern, 10,000 pounds.

6. That statutory one-pound reportable quantity for methyl isocyanate under CERCLA section 102(b) may be adjusted in a future rulemaking action.

Appendix A
List 2

Additional Hazardous Chemicals
Chemical Abstract

Chemical Name	Service Number
Acetaldehyde	75-07-0
Acetyl Peroxide	110-22-5
Acetylene	74-86-2
Allene	463-49-0
Ammonium Azide	12164-94-2
Ammonium Perchlorate	7790-98-9
Benzoyl Peroxide	94-36-0
3-Bromopropyne	106-96-7
1,2-Butadiene	590-19-2
Butadiene, Inhibited	106-19-2
Butane Mixed	106-97-8
2-Butanone Peroxide	1388-23-4
Buten-3-Yne	78-80-8
1-Butene	106-98-9
2-Butyne	503-17-3
Calcium Carbide	75-20-7
Carbon Monoxide	630-08-0
Carbonyl Sulfide	463-58-1
Cis-2-Butene	590-18-1
Collodion	9004-70-0
Cumene Hydroperoxide	80-15-9
Cyanogen	460-19-5
Cyclobutane	287-23-0
Cyclopropane	75-19-4
Cyclotetramethylenetetranitramine	2691-41-0
Cyclotrimethylenetrinitramine	121-82-4
Di-Tert-Butyl Peroxide	110-05-4
Diazodinitrophenol	87-31-0
Diborane	19287-45-7
Dichlorosilane	4109-96-0
Diethyleneglycol Dinitrate	693-21-0
1, 1-Difluoroethane	75-37-6
Difluoromonochloroethane	75-68-3
Diisopropyl Peroxydicarbonate	105-64-6
Dimethyl Ether	115-10-6
Dimethyl Sulfide	75-18-3
Dimethylamine, Anhydrous	
1, 3-Dinitroglycerine	623-87-0
Distearyl Peroxydicarbonate	52326-66-6
Ethane	74-84-0
Ethane/propane Mix	
Ethyl Chloride	75-00-3
Ethyl Ether	60-29-7
Ethyl Mercaptan	75-08-1
Ethyl Nitrite	109-95-5
Ethylamine	75-04-7
Ethylene	74-85-1
Ethylene Glycol Dinitrate	628-96-6

Ethylene Oxide	75-21-8
Formaldehyde Gas	50-00-0
Furan	110-00-9
Hydrocarbon Mixture	Unassigned
A-24 (R) Hydrocarbon Propellant	
Hydrocarbon Propellant-Butane Mixture	
Hydrocarbon Propellant-Propane Mixture	
Hydrogen	1333-74-0
Hydrogen Cyanide, Anhydrous, Stabilized	4-90-8
Hydrogen Sulfide	7783-06-4
Isobutane	75-28-5
Isobutane-Butane Blend	
Isobutene	115-11-7
Isopentane	78-78-4
Isoprene	78-79-5
Isopropyl Chloride	75-29-6
Isopropylamine	75-31-0
Lead Nitroresorcinate	51317-24-9
Lead Styphanate	15245-44-0
Lithium Hydride	7580-67-8
M-Nitrotoluene	99-08-1
Mannitol, Hexanitrate	15825-70-4
Methane, Compressed	74-82-8
Methane, Refrigerated Liquid (Cyrogenic Liquid)	74-82-8
Methyl Acetylene	74-99-7
Methyl Chloride	74-87-3
Methyl Formate	107-31-3
Methyl Mercaptan	74-93-1
Methyl Nitrate	598-58-3
2-Methyl-1-Butene	583-46-2
Methylamine, Anhydrous	74-89-5
Methylamine, Anhydrous	74-89-5
Methyl Cyclopropane	594-11-6
N-Butane	106-97-8
N-Butyl-4, 4-Di-(Tert-Butyl Peroxy) Valerate	995-3-5
N-Propyl Nitrate	627-13-4
Naphtha	8002-05-9
Neopentane	463-82-1
Nickel	7440-02-05
Nitrogen Triiodide	13444-85-4
Nitroglycerin	55-63-0
Nitrostarch, Dry	9056-38-6
Nitrostarch, Wet	9056-38-6
O-Nitrotoluene	88-72-2
1,3-Pentadiene	504-60-9
Pentaeythritol Tetranitrate	78-11-5
Pentane	109-66-0
Phosphine	7803-51-2
Phosphorous	7723-14-0
Propane	74-98-6

Propane-Isobutane Blend	
Propane (15.7%)Isobutane Blend	
Propane (43.6%)Isobutane Blend	
Propane, Refrigerated Liquid (Chryogenic Liquid)	74-98-6
Propylene	115-07-1
Propylene Oxide	75-56-9
Reformate Naphtha	68955-35-1
Silane	7803-62-5
Tert-Butyl Hydroperoxide	75-91-2
Tert-Butyl Peroxyacetate	107-71-1
Tert-Butyl Peroxybenzoate	614-45-9
Tert-Butyl Peroxypivalate	927-07-1
Tert-Butylamine	75-64-9
Tetrafluorethylene	116-14-3
Trans-2-Butene	624-64-6
Trichlorosilane	10025-78-2
Trifluorochloroethylene	79-38-9
Trimethylamine	75-50-3
Trinitrobenzoic. Acid, Dry	129-66-8
Trinitrobenzoic Acid, Wet	129-66-8
Trinitroresorcinol	82-71-3
Trinitrotoluene, Wet	118-96-7
Vinyl Chloride	75-01-4
Vinyl Ethyl Ether	109-92-2
Vinyl Fluoride	75-02-5
Vinyl Isopropyl Ether	926-65-8
Vinyl Methyl Ether	107-25-5
Vinylidine Chloride	75-35-4
Zirconium Metal, Dry	7440-67-7
Zirconium Scrap	7440-67-7

Appendix B

SCREENING ELEMENTS

A written summary of answers to the following questions must appear in the case file. Not all questions will be applicable to every workplace. Conversely, any additional information which bears on process safety but which is not addressed here shall also be put in the case file.

1. How many of the chemicals listed in Appendix A are involved in the operation? Produced, used, stored or handled?

2. How many of the chemicals listed in Appendix A are used in quantities equal or greater than the amounts listed?

3. What is the size of the facility (i.e., number of employees)? Number of square feet under the roof and acres in the plant? What is number of processes that involve Appendix A chemicals?

4. What is the age of the machinery or units used where Appendix A chemicals are involved?

5. What is the relevant history of the facility? Releases or spills of toxic chemicals? Any EPA reportable releases or spills? Previous or current inspection violations? Explosions or Fires?

6. Are there comprehensive management programs including loss prevention, hazard evaluation, reactive materials, inspection and maintenance, plant modification, training, and emergency response?

7. Does the loss prevention program include safety and health self-audits? Frequency? Corporate, local, or contracted?

8. Is there a viable Labor/Management Safety and Health Committee? Are there regular and frequent meetings and walk-through inspections? Are there prompt resolution of detected hazards?

9. Are incidents (spills, leaks) investigated and are corrective actions taken? Are records made of incident investigations and subsequent corrective recommendations/actions?

10. Is there an environmental monitoring program? Scheduled or continuous monitoring with alarms for highly toxic chemicals?

11. Are there scheduled shutdowns for comprehensive maintenance? Is maintenance preventive and programmed, or reactive to breakdowns? Is there a testing and calibration schedule for critical equipment? Is there any indication that previously installed pressure relief devices have been removed, plugged, or blinded? Are there permit systems for confined space, lock-out, line breaking, hot work?

12. Is material compatibility, flammability, and reactivity considered in all aspects of design? Is there a nondestructive testing program?

13. Are the programs administered by, or is there access to, qualified safety and health professionals? Are these personnel educated, certified, licensed, and/or experienced?

14. Is there formal and periodic training conducted in operating procedures, process hazards, emergency programs, permit systems, release mitigation, PPE, and HAZCOM? Are there written PPE and respirator programs? Hands-on training and appropriate equipment available?

15. Are there exothermic chemical reactions which can "run away" if not controlled? Do the processes use catalysts, inhibitors, or initiators? Are any processes operated near auto-ignition, explosive, or flammable ranges? Are these processes purged and inerted? Are there extremely high or low temperature/pressure reactions? Are there pressurized vessels which contain highly toxic chemicals?

16. Are there environmental controls (i.e., scrubbers, flares, incinerators, destruct systems, etc.) in place to prevent toxic chemical releases? Are there redundancies incorporated in these controls?

17. Are there utility systems that are critical to maintenance of safe operation (i.e., cooling water, electric, heating)? Do they have back-up systems incorporated in them? Are back-up systems provided for computer generated controls or other equipment which may be considered essential? Has any analytical evaluation of fail-safe been conducted (i.e., Fault Tree Analysis, HAZAN, FMEA, etc.)?

18. Are there written emergency/evacuation procedures? Are they coordinated with local authorities? Are emergency control center(s) established? Are there re-entry and clean-up procedures?

19. What is the CSHO's overall impression of the facility in regard to its potential for catastrophic release? Included in factors contributing to this impression may be those such as:

    - Results of employee and management interviews.
    - Evidence of equipment or structural corrosion.
    - Evidence of leaking equipment or chemical spills.
    - General maintenance, clean and orderly plant conditions.
    - Number and type of hazardous chemicals which are vented to the atmosphere.

Appendix C

SYSTEMS SAFETY INSPECTION GUIDELINES

I. Introduction. This appendix provides written guidelines for evaluation of chemical workplace programs, plans and systems for the prevention of catastrophic chemical releases, fires and explosions. It encompasses users, handlers and manufacturers of extremely hazardous substances as defined in Appendix A of this notice.

A. Experience indicates that systems safety evaluations are useful in identifying potentially hazardous conditions and that this approach is more appropriate than an ordinary inspection of physical conditions. Safe manufacture and use of hazardous chemicals depends on comprehensive management and physical systems, including such factors as written management philosophy and policy, hazard evaluation, design, construction, personnel training, operations, maintenance, managemental controls, operating control systems and emergency preparation.

1. This appendix is divided into four major sections: management programs; hazard identification and assessment; process design and control; and emergency programs. They should be used together in evaluating the whole network of protections available at the plant. Clearly, many protective measures can and should be considered both from the point of view of preventing incidents and minimizing hazards when an emergency occurs.

2. The guidelines provided here are general. They are intended for use in a wide spectrum of workplaces which produce, handle, store and use industrial and consumer chemical products. This means that a great deal of professional judgment will be expected of CSHO's who apply the guidelines. They should no be used as an unvarying checklist against which to judge the employer's performance but instead as a tool for:

a. Understanding the employer's approach to prevention of catastrophic emergencies.

b. Determining the adequacy of the employer's plans for protecting employees when an emergency situation exists.

B. The evidence evaluated during these inspections will be a combination of documentary and physical. This is especially appropriate for the evaluation of management programs and emergency plans where information will be gathered from plant management personnel and then verified through inspection of physical equipment and interviews with employees. While the evidence gathered during these inspections will be used to support violations of existing OSHA standards or supportable 5(a) (1) violations according to the criteria established in OSHA Instruction CPL 2.45A, the purpose of the inspection is not limited strictly to enforcement of standards. Letters of recommendation for potential hazards identified during the inspection should also be prepared and sent to the employer when citations cannot be supported.

II. CSHO'S Tasks. The compliance officer(s) performing a chemical system safety inspection needs to review four main areas in order to determine whether or not the chemical systems have been adequately safeguarded. To assist in this review, detailed outlines have been included in this appendix covering all four areas. Compliance officers should use these outlines as an inspection aid to formulate appropriate questions to ask plant management and employees and identify areas that require additional inspection attention. While the outlines are comprehensive, they should not be considered all encompassing. If additional problem areas are discovered while undertaking this review, they should be pursued.

NOTE: References are included in Appendix D to provide a starting point for research into additional areas that may be of concern.

A. FIRST TASK - Plant Management Programs. The first task is to review the management programs currently in effect at the plant. These programs normally include loss prevention programs, communications, plant and process design, hazard evaluation of processes, training, inspection, maintenance, modifications and repair. This evaluation is normally a two-step process. First, management programs must be identified and their extensiveness determined.

This is usually accomplished by discussing the programs and their implementation in the plant with management officials. An extensive outline is provided at the end of this section to aid the compliance officer in identifying and evaluating the most common management programs in effect for establishments which produce, handle and/or use the - hazardous chemicals.

NOTE: All the programs indicated in the outline may not be in place at a particular plant and those programs that are in effect may not be as extensive as the outline indicates. Thus the compliance officer is faced with the task of determining if the lack of a program or lack of a complete program contributes to potential hazards in the plant. This can be an extremely difficult task and determination may have to wait until additional information is received and/or other plant systems have been evaluated. In addition, a management program may not be necessary because the potential hazards have been dealt with at another level or in another plant system. However, one way to approach this problem is to look for repetitive patterns (i.e., accidents, injuries, spills, releases, near-misses) that could be prevented if a new management program were to be implemented or a current one revised.

The second step of this process involves verifying that these management programs are in place and that they are effectively implemented. This is normally done by reviewing records (i.e. , results of hazard reviews; P&IDs; OSHA record keeping and accident investigations; spill reports; training programs and maintenance records), performing spot checks of physical equipment related to these programs and interviewing employees.

1. MANAGEMENT PROGRAMS

1.1. LOSS PREVENTION PROGRAM

1.1.1. Safety Audits
1.1.2. Safety Committees (joint employee/employer)
1.1.3. Job safety Analysis (JSA)
1.1.4. Records of fires, explosions and releases
1.1.5. Accident investigations
1.1.6. Incident and near-miss reports
1.1.7. Management responsibility for safety
1.1.8. Critical element in performance standards
1.1.9. Clear delegation of responsibility

1.2. COMMUNICATIONS
1.2.1. Job classifications spell out employee duties and responsibilities.
1.2.2. Clear lines of authority and responsibility
1.2.3. Process operation status transmitted to oncoming personnel during shift changes.
1.2.4. Operator jargon understood by all plant and maintenance personnel.
1.2.5. Availability of knowledgeable personnel on all shifts.

1.3. DESIGN CONSIDERATIONS

1.3.1. Criteria for layout and spacing
1. Safe distances between units
2. Oil insurance industries spacing table
3. Vapor cloud dispersion modeling
4. Adequate spacing for emergency response

1.3.2. Criteria for hazardous systems
1. Developed according to consensus standards.
2. Understanding of reactions involved to determine hazards.
3. Corrosion, erosion, fatigue, fouling, and cavitation.
   1. Hydrogen embrittlement
   2. Stress corrosion cracking
   3. Galvanic Corrosion
4. Vibration, hammer, loadings, expansion, contraction, thermal/mechanical shock, cycle of activities, moisture, contaminants, etc.

5. Scale-up
6. Pilot plant operation/process data
   1. Substitution of less hazardous material
   2. Minimizing hazardous process conditions
      1. Lower pressure
      2. Inventory reduction
      3. Lower temperature
   3. Reduction of hazards
   4. Pre-, during and post- construction audits and evaluations.
   5. Clearly stated operating limits for process variables (i.e., temperature, pressure, level, flow, chemical reactivity, mechanical stress, etc.).
   6. Worst case values
      1. Margin between operating limits and worst case.

1.4 HAZARD EVALUATION

1.4.1. Process hazard reviews such as:
1. Hazard and Operability Studies (HAZOP)
2. What If
3. Cause/Consequence Analysis
4. Event Tree Analysis
5. Failure Modes and Effects Analysis (FMEA)
6. Fault Tree Analysis
7. Human Error Analysis
8. Fire, Explosion, Toxicity Indices (i.e., DOW, MOND).
9. Management Oversight and Risk Tree Analysis (MORT).

1.4.2. Process Hazard Review Considerations
1. Review team includes operating, technical, mechanical and design personnel, as appropriate.
2. Staffed with personnel high enough in the organization to obtain cooperation needed throughout the plant.
3. Follow up of recommendations to ensure implementation.
4. Reviews adequately documented

1.4.3. Process Flow Diagrams
1. Completely describes process
2. Normal operating conditions and limits described including energy balances.
3. Maintained, available and up-to-date

1.4.4. Piping & Instrumentation Diagrams (P&ID)
1. Prepared for each process
2. Kept up-to-date with all modifications
3. All necessary alarms and shutdown systems shown.
4. Dates of changes noted
5. Approval by management and engineering

1.5. REACTIVE MATERIALS PROGRAM

1.5.1. Compatible materials of construction for:
1. Process equipment
2. Piping
3. Storage and surge systems
4. Gaskets and seals
5. Pumps and other rotating machinery

1.5.2. Information sources that should be utilized:
1. Raw material MSDS's
2. Material product bulletins
3. Technical & scientific literature

1.5.3. Testing programs
1. Reactive material testing
2. Corrosion testing
    1. Test coupons
    2. Inspections with Non-Destructive Examination (NDE) techniques
        1. For equipment with internal linings, tests done for liner leaks and behind liners.
    3. Testing to identify contaminants or proper chemical balances.
    4. Procedures to ensure proper selection of materials.
        1. Purchase order specifications
        2. Maintenance and inspection programs
    5. Contamination control techniques
        1. Inerting to exclude air or oxygen
        2. n-line filters to remove particulates.
        3. Back flow protection on piping
        4. Vent headers
            1. Proper sloping to prevent material from draining back to vessel.
            2. Not manifolded to incompatible material lines.
            3. Incompatible fittings for utilities (i.e., air and nitrogen).

1.6. INSPECTION, MAINTENANCE, MODIFICATION AND REPAIR

1.6.1. Maintenance Manuals
1. Available for all equipment
2. Kept in safe location
3. Available to personnel performing work

1.6.2. Permit systems
1. Work Authorization
    1. Written in plant operating manual
    2. Identifies hazard level
    3. Establishes safe work parameters
    4. Designates PPE to be worn
    5. Contains time and location limits
    6. Sign off by authorized persons
2. Confined space
    1. Work authorization system
    2. Entry permit
    3. Isolation - blanking, zero mechanical state, lock-out.
    4. Atmospheric testing (oxygen, flammables, toxins)
    5. Stand-by personnel
    6. Emergency rescue
3. Equipment and/or machinery lock-out
    1. Work authorization system
    2. Identification of equipment being worked on.
    3. Individual locks or tags
    4. Procedures for lock/tag removal and equipment start-up.
4. Line breaking and system opening
    1. Work authorization system
    2. Identification of materials in line
    3. Isolation procedures
    4. Purging/cleanout/material disposal
    5. Procedures for opening line or equipment.
    6. Contamination prevention
    7. Proper replacement parts
    8. Return to service
5. Hazardous material work (i.e., highly flammable or toxic).
    1. Work authorization system
    2. Control of ventilation
    3. Approved equipment
    4. Proper emergency equipment available

5. Area restricted to qualified personnel only
6. Notification of operating personnel of maintenance.
7. Inspection of work

6. Hot work
   1. Work authorization systems
   2. Classified areas
   3. Tanks, vessels (isolation, monitoring)
   4. Combustibles in area
   5. Fire watch

1.6.3. Preventative maintenance
1. Critical equipment to be included:
   1. Pressure Vessels
   2. Piping
   3. Emergency Relief Systems
   4. Alarms and interlocks
   5. Bellows-type expansion joints
   6. Flame arrestors and emergency vents
   7. Overspeed trip systems
   8. Destruct systems - scrubbers, flares
   9. Rotating machinery
2. Periodic testing depending on service
3. Shutdown precautions
   1. Back-up systems
   2. Person stationed to monitor system
   3. Immediate repair of critical safety equipment.
   4. Leak detection
      1. Fugitive Emissions
      2. Seals
      3. Packings
      4. Flanges
      5. Furnaces
      6. Scrubbers
      7. Incinerators
      8. Drains
   5. Vibration monitoring

1.6.4. Outside contractors
1. Contract language
2. Pre- and post- contract meetings
3. Contractor safety program assurance
4. Monitoring and liaison
5. Training
6. HAZCOM
7. Enforcement
8. Documentation

1.6.5. Inventory Control Program
1. Spare parts inventory
2. Review of incoming materials against purchase orders.
3. Quality assurance of repair parts
4. Color coding by material grades

1.6.6. Calibration and testing of equipment
1. Type to be included:
   1. Instruments-pressure, temperature, flow, etc.
   2. Alarms and sprinkler systems
   3. Emergency Relief devices
   4. Chart recorders
   5. Probes

6. Load cells and tank level controls
7. Interlock systems

2. Inspection techniques to be used:
   1. Function testing
      1. Bench testing
      2. On-line testing
   2. Visual inspection
   3. Non-Destructive Testing such as:
      1. Magnetic particle
      2. Dye Penetrant
      3. Ultrasonic
      4. Acoustical Emission
      5. Radiographic
      6. Eddy current
      7. X-ray
      8. Spark testing
      9. Hydrostatic or pneumatic

1.6.7. Plant Modifications

1. Work Authorization
   1. Approved by manager and engineers
   2. Consequences of change
   3. Specify change in detail
2. Change must meet same standards as original plant.
   1. Appropriate engineering practices are followed:
      1. Design
      2. Engineering
      3. Procurement
      4. Installation
      5. Inspection
   2. Correct materials of construction and fabrication used.
   3. New, modified, and existing equipment have the same (or compatible) design basis.
   4. Necessary changes in operating conditions are made.
   5. Modification does not change electrical classification, vent size requirements, alarms, trips, or other effects on safety.
3. Training Program
4. Test modification before placing in production.
5. Inspect to see if modification plan has been followed.

1.7. TRAINING

1.7.1. Operating manuals

1. Written, concise, complete, available, and current SOP's.
   1. Normal start-up/shutdown procedures
      1. Equipment functioning properly
      2. Emergency devices in working order.
      3. Equipment is cleaned or decontaminated.
      4. Procedures for unexpected operation.
   2. Normal operating procedures
      1. Operating limits specified (i.e. , pressure, temperature)
      2. Defined sequence of operating steps.
      3. Batch log sheets with sign off steps.
      4. Process chart monitoring with sign-off steps.
      5. Emphasis on critical safety steps.
      6. Practices for safe operation
      7. Procedures for minor process upsets.
      8. Sign-off for set point change
      9. Normal shutdown procedures

3. Emergency shutdown procedures
    1. Define abnormal conditions
    2. Sequential shutdown steps
    3. Removal techniques for flammable, unstable, corrosive, or toxic materials.
    4. Operator, supervisor and maintenance responsibilities (internal and to public).
2. Periodic review and updating
3. Instruction and training of personnel
4. Trouble shooting of equipment

1.7.2. Human error
1. Consequences of failure to perform a task.
2. Consequences of incorrect performance of tasks.
3. Procedures and controls to minimize errors.

1.7.3. Safety training
1. Process hazards and control
2. Emergency programs including alarm systems.
3. Accident/incident investigation
4. HAZCOM
5. Permit systems
6. Emergency shutdown
7. Fire protection
8. Spill containment
9. Personal protection equipment

1.7.4. Security, visitor and vendor control
1. Plant security
    1. Hazardous areas restricted
        1. Areas fenced off
        2. Accessible by authorized personnel only.
        3. Guard at gate or pass entry system.
    2. Night security patrol/guard dogs
2. Visitors and vendors
    1. Reception area
    2. Required to sign in/out
    3. Badges - distinguish between plant and office areas.
    4. PPE required
    5. Only certain personnel authorized to allow entrance.
    6. Escorted in hazardous areas
    7. Knowledge of emergency procedures

B. SECOND TASK - Hazard Identification and Assessment. Before the compliance officer can determine the adequacy of the process design, controls and emergency procedures, the hazardous chemicals being stored, transferred, processed or used in the chemical systems must be identified and their hazard potentials assessed. Only when the degree of hazard presented by these chemicals and their potential reactions is known can a determination be made as to whether or not the system has been properly safeguarded.

Appendix A of this notice can be used as a guide for identifying materials and quantities which are considered hazardous in terms of catastrophic release, fire or explosion. However, it is not an all-inclusive listing and all materials used in a chemical system should be screened for their hazard potential. This usually isn't too difficult for one or two component chemical systems, but the determination becomes exceedingly complex for multi-component systems. When such systems are encountered, it is generally acceptable to make the chemical hazard assessment based on the most hazardous chemicals in the system (in terms of toxicity, flammability and/or reactivity). In addition, particular process which do not enter as raw materials or leave as finished products or wastes.

2. CHEMICAL HAZARD ASSESSMENT

Three areas are to be considered in making the chemical hazard assessment: (1) material properties, (2) chemical reaction processes and (3) unit physical operations. Each is discussed separately below:

2.1. MATERIAL PROPERTIES information regarding the physical and chemical properties of the previously identified hazardous chemicals utilized in chemical systems must be obtained. In addition, information on the fire and explosion potential, chemical reactivity and health hazards posed by the chemicals also need to be evaluated. This information is used to assess the hazard potential of the chemicals in their original physical states.

Free energy considerations may also be used as an indication of potential energy of a material and the probability of a reaction proceeding (and the energy to be released).

The best place to begin to assemble this information is by obtaining copies of material safety data sheets for the raw materials, intermediates and finished products used in the chemical systems. Other sources of information include product bulletins issued by chemical manufacturers. These publications often provide additional technical information in regards to chemical reactivity, control measures and hazards.

Appendix D contains a list of references which may be useful in obtaining this information. Furthermore, the employer may have additional information on the reactivity of the chemicals used in the chemical systems through testing. Some of the more common methods are listed in the outline below:

2.1.1. CHEMICAL TEST METHODS
1. Thermal Stability Test
2. Detonation Test with blasting cap
3. Impact Test
4. Drop Weight or Hammer Test
5. Card Gap Test
6. Thermal Shock Decomposition Test
7. Lead Block Test
8. Influence Test
9. Self Accelerating Decomposition Test
10. Differential Thermal Analysis (DTA)
11. Autoignition
12. Flammability

2.2. CHEMICAL REACTION PROCESSES

This information is used to assess the hazard potential while the materials are undergoing chemical change so as to determine whether or not the reaction can be operated safely. Some processes present more hazards than others, but they can be classified according to the hazard characteristics they exhibit.

The following outline lists the hazard characteristics and some types of processes normally associated with them:

2.2.1. REACTION HAZARD CHARACTERISTICS AND REACTION TYPES
1. Processes subject to explosive reaction or detonation under normal conditions
   1. Nitration
2. Processes subject to explosive reactions or detonation when exposed to shock or abnormally high temperatures or pressures.
   1. Animation with ethylene oxide
   2. Double decomposition with strong oxidizers.
3. Processes subject to spontaneous polymerization
   1. Condensation polymerization
   2. Addition polymerization
   3. Free-radical polymerization

4. Processes subject to exothermic reactions with development of excessive temperatures and pressures.
   1. Alkylation
   2. Animation by ammonolysis
   3. Condensation
   4. Halogenation
   5. Hydrogenation
   6. Nitration
   7. Polymerization
5. Processes in or near the explosive range of the reactants or products.
   1. Oxidation
6. Processes which may release environmental contaminants or pollutants into the atmosphere.
   1. Hydrolysis and Hydrations
   2. Pyrolysis or Cracking
   3. Reductions
7. Processes which use or produce toxic substances. 1. Insecticide production with methyl isocyanate.
8. Processes which use or produce very corrosive materials.
   1. Aromatization and isomerization
9. Processes which produce flammable or explosive substances and/or by-products.
   1. Chlorine production by electrolysis of brine.
   2. Neutralizations
   3. Hydrocarbon "cracking"
10. Processes which react energetically with water or common contaminants with dangerous potential.
   1. Grignard reactions
   2. Nitrations
   3. Reduction of hot molten materials
   4. Sulfonations

In addition to the types of chemical process reactions, the parameters under which these reactions take place also affect the hazard potential of the chemicals. The following outline summarizes process parameters which can increase the hazard potential of chemical process reactions.

2.2.2. CHEMICAL REACTION PROCESS PARAMETERS

1. Type of process
   1. Multiple use of vessels
   2. Manual batch operations
   3. Manual continuous operations
   4. Automatic batch operations
2. Problems associated with increasing temperature.
   1. Pressure increases
   2. Reaction rate increases
      1. Generally doubles for every 10 degrees C temperature rise.
   3. Corrosion rate increases
   4 Equilibrium condition changes
   5. Instability of products
   6. Destruction of products and feed stocks
3. Problems associated with increasing pressure.
   1. possibility of equip..equipment rupture
   2. Increase in reaction rate
   3. Increase in corrosion rate
   4. Difficulties in maintaining sealed equipment.
   5. Increase in temperature
4. Special process considerations
   1. Operation at or near explosive or auto-ignition range.
   2. Operation above flash or boiling points

3. Operation with catalysts or initiators
4. Operation with pyrophoric or explosively decomposing materials.
5. Operation in aged or modified equipment

Detailed discussion regarding the hazards associated with particular chemical reactions and how they are affected by process parameters is beyond the scope of this notice; however, if additional information is needed, the list of references provided in Appendix D of this notice should provide a good starting point.

2.3. UNIT PHYSICAL OPERATIONS

This information is used to assess the hazard potential of chemicals in the different forms they may take while being processed in chemical systems. In addition to the chemical reaction processes, a number of operations conducted in a chemical system are purely physical, these are called "unit" operations. Many serious losses have occurred in this area of plant operations because physical changes may increase or decrease the fire, explosion and/or health hazards of a material depending on the nature of the change. A general outline on those unit operations which increase hazard potential appears below:

2.3.1. Vaporization and diffusion of flammable or toxic liquids or gases.
1. Distillation
2. Evaporation
3. Absorption
4. Hydrocarbon "cracking"

2.3.2. Spraying, misting or fogging flammable, combustible or toxic liquids.
1. Dispersing-Diffusing
2. Filtering
3. Centrifuging
4. Mixing
5. Agitating
6. Separating(layering and floatation)
7. Classifying (screening)
8. Precipitating
9. Spray drying or prilling

2.3.3. Dusting and dispersion of combustible or toxic solids.
1. Grinding
2. Crushing
3. Milling
4. Machining
5. Compacting
6. Extruding
7. Screening
8. Dust collecting
9. Conveying/stock piling

2.3.4. Mixing combustible materials and strong oxidizing agents.
1. Neutralization
2. Extraction
3. Absorption and scrubbing

2.3.5. Temperature or pressure increase of unstable chemicals.
1. Incineration
2. Heating or heat transfer

2.3.6. Exposing unstable chemicals to friction or shock.
1. Granulating
2. Molding

2.3.7. Separation of hazardous chemicals from protective inertants or diluents.
1. Drying
2. Dehydrating
3. Solvent reclamation

Detailed discussions regarding the hazards associated with each of these unit operations is beyond the scope of this notice; however, if additional information is needed, the references listed in Appendix D of this notice should provide a good starting point.

C. THIRD TASK - Process Design and controls.

The third task is to understand how operational processes are kept within safe bounds under normal conditions. Conceptually, it is the normal process instrumentation and control measures that provide the first and greatest degree of protection to plant employees and to the public. The compliance officer must understand how critical failure points are identified and what controls are used to ensure safe operations. This involves assessing the interrelationships between the components, and particularly, identifying which safety features in the system should be backed up with alternative instrumentation, procedures, or equipment designed to ensure that process variables are maintained within safe parameters.

The evaluation of a single system does not pose much of a problem in this regard, but a chemical processing facility bay have several such systems with some shared common elements between them. In this case, it s easier to perform the necessary evaluations if the plant is broken up into three main categories that are relatively independent of one another. The first includes general plant controls which are common to all processes conducted at the plant. The second includes specific process reactor controls where the chemicals being processed are undergoing chemical reactions; and the third includes specific process unit controls where the chemicals are undergoing physical operations which involve no chemical changes. Again, a detailed outline is provided at the end of this section to aid the compliance officer in evaluating what controls may be necessary and to what extent they need to be applied.

The amount of control technology that needs to be applied will be directly related to the inherent hazards present in the process which was identified in the second task. The failure of a single component or system should not expose the public, plant personnel or property to unreasonable risk. If the potential for a truly catastrophic release exists, one may have to provide for double or even triple contingency for failure. For example, provisions for a dump tank, scrubber, and flare may be necessary for some highly hazardous materials. Thus it is extremely important that the compliance officer obtain information both from the employer and via independent research as to the hazards posed by the particular process(es) that are being reviewed by the chemical systems safety approach.

3. PROCESS DESIGN AND CONTROLS

3.1. GENERAL PLANT CONTROLS

3.1.1. DIRECT FIRED SYSTEMS (FURNACES, BOILERS AND HEATERS).
1. Adequate draft
2. Fuel controls
    1. Automatic fuel shutoff if pilot flames out.
    2. Manual reset for cutout valves
    3. Testing of cutout system
    4. Cutout valve bypasses car sealed closed
    5. Pressure Alarm High (PAH) and Pressure Alarm Low (PAL) on fuel gas and pilot gas provide downstream of control valve.
    6. Steam purge connections
    7. Automatic fuel/air ratio
    8. Interlocks and controls to purge firebox before burner light off.
    9. Interlocks for safety shutdown
        1. High gas pressure

2. Low gas pressure
3. Low combustion air flame
4. Low boiler water (double switched)
5. Proper testing frequency

3. Feed water system
    1. High and low water level alarms
    2. Duplicate feed water pumps
    3. Low water cutoff of gas or oil burners
    4. Two redundant water level switches interlocked with gas/oil supply for non-attended operation.
    5. Level gage independent of level controls
    6. Manual control of feedwater in case of failure of regulator.
4. Pressure relief devices
    1. Properly supported
    2. Drains provided for condensate
    3. Set no higher than MAWP of vessel plus 10%.
    4. Isolation of discharge piping
    5. sizing criteria
    6. Discharge to safe location
5. Piping
    1. Expansion flexibility
    2. Properly supported
    3. Antifreeze protection
    4. Flushing out pipes during start-up
    5. Avoid cast iron in piping subject to strain.
    6. Instrumentation and controls
        1. Controller and control valves accessible for maintenance.
        2. High temperature alarms
        3. Provisions for safe operation during power failure.
        4. Backflow protection
        5. Fuel gas KO drum available with level alarm.
        6. Bleed off every shift to prevent corrosion.
        7. Monitors for tube skin temperature
    7. Inspection and maintenance
        1. Yearly inspection by authorized inspector
        2. Repairs according to ASME code
        3. Properly trained and certified personnel

3.1.2. FIRE PREVENTION SYSTEMS

1. Electrical wiring and classification
    1. Installed in accordance with National Electrical Code.
    2. Equipment approved for location
    3. Maintained in good order
    4. Seals in conduit installed at proper intervals when necessary.
    5. Flexible connectors used for conduit approved and intact.
    6. Properly bonded and grounded, clean and tight connections.
    7. Lightning protection using protecting ground wires, rods or masts.
    8. Clearance or insulation from hot surfaces
    9. Portable heaters
        1. Secured against tipping
        2. Clear of combustibles
        3. Mounted on noncombustible surface
        4. Checked for emissions of CO
        5. Approved for location
2. Structural considerations
    1. Fire doors unblocked and fusible links intact.
    2. Steel columns covered with fire resistant coating.

3. Identification and control of sources of ignition.
    1. Hot surfaces
        1. Pipes
        2. Boilers and furnaces
        3. Soldering irons
        4. Welding torches
    2. Smoking
        1. Labeling of nonsmoking areas
        2. Proper receptacles
        3. No discarded smoking materials
    3. Static electricity
        1. Moving machinery grounded
        2. Piping and vessels properly bonded and grounded.
        3. No splash filling - have inlet pipe reach to vessel bottom.
        4. Drum filling and portable containers bonded.
    4. Spontaneous ignition
        1. Flammable waste material in closed metal containers.
        2. Containers emptied frequently
        3. Piled material in a cooled, dry, ventilated area.
    5. Friction
        1. Machinery properly lubricated
        2. Machinery properly adjusted or aligned.
4. Fire extinguishing systems
    1. Designed and maintained in accordance with 29 CFR 1910, Subpart L.
        1. Sprinklers
        2. Water cannons/fixed monitors
        3. Deluge systems
        4. Foam
        5. Chemical systems (Halon, Carbon dioxide)
        6. Portable Extinguishers

3.1.3. ATMOSPHERIC AND LOW PRESSURE TANKS

1. Design criteria
    1. According to acceptable code
        1. OSHA 1910.106
        2. API Std. 2000
        3. UL Standards
        4. ASME Unfired PV code (Div. VIII)
    2. Corrosion control
        1. Cathodic protection
        2. Protective coating or lining
        3. Special materials of construction
2. Over and underpressurization protection
    1. Fire protection (21% above MAWP)
    2. Runaway chemical reaction (10- above MAWP).
    3. Vacuum
3. Venting Options
    1. To a destruct system or a safe location where no hazard shall be created by the venting (employee cannot be exposed to toxins or highly flammable materials).
    2. Breather vents to atmosphere with inert gas in free vapor space of tank (i.e., flammable and combustibles).
    3. Open vents with flame arrestors that do not impinge on tank (i.e., noncombustible, nontoxic materials)
4. Instruments and controls
    1. Pressure, temperature, liquid level
        1. Controller, indicator, or alarm
        2. Redundancy
    2. Discharge lines larger than fill lines
    3. Vacuum breakers or open vents

4. Refrigeration and heating
    1. Backup
    2. Alarms for temperature variations past set points.
    3. Pressure relief, venting
    4. Compatibility of heat transfer medium with process material.
    5. Heat transfer medium maintained below flash point.
5. Diking and drainage
    1. Ditches properly lined and impermeable
    2. Dikes hold capacity of largest tank
    3. Means of access in and out of dikes
    4. Drainage to prevent rain water build-up
6. Fire protection
    1. Inerting and purging
    2. Blast nets or walls
    3. Fire protection systems
        1. Fixed monitors
        2. Deluge systems
        3. Sprinklers
7. Inspection and maintenance
    1. Nondestructive testing
    2. Vents properly maintained to keep in good working order and free of corrosion or fouling.
    3. Frequent testing of level indicators
    4. Manual gaging for inventory control

3.1.4. EMERGENCY AND DESTRUCT SYSTEMS

1. Dump or quench tanks
2. Incinerator
3. Thermal oxidation unit
    1. Not used for emergency venting
    2. Hold up tanks
4. Scrubbers
    1. Material circulated
    2. Normal venting
    3. Emergency venting
    4. Emergency mode - single pass through, how actuated, increase caustic, alarmed.
    5. Circulation pump
        1. Backup
        2. Alarmed
        3. Interlocked to shut down reactor if down.
    6. Surge tank for increased reaction time
        1. Pressure rating
    7. Pressure relief device
        1. Set point
        2. Vents to atmosphere, vent header
    8. Operating temperature, heated for efficiency.
    9. Inlet feed lines
    10. Destruct efficiency
        1. How calculated
5. Flare tower
    1. Knock out pot to separate livid
        1. Pressure relief device
        2. Liquid level indicator
        3. Steam or electrical tracing
        4. Automatic draining
        5. Pressure rating
    2. Alarms, backup
        1. Procedures to follow if flare must go down.

3. Pilot lights
    1. Redundant
    2. Manual/automatic relight
4. Flame sensor
5. Assist gas for emergency venting
6. Excess effluent alarms
7. Inert gas purge
    1. Exhaust several volumes before per-fitting relighting.
8. Water seal between stack and collection system to prevent flashback.
9. Stack height at proper level
    1. Dispersion calculations to ensure that toxic gas concentrations at ground level are not exceeded.

3.1.5. PRESSURE RELIEF DEVICES AND ASSOCIATED PIPING

1. Design criteria
    1. Runaway reaction
        1. IRI Nomograph
    2. Two-phase flow
        1. Actual system testing
        2. DIERS
    2. Separate lines for each protected vessel to vent header.
    3. Exclusion of incompatible materials
    4. Proper pitch to prevent material from draining to vessels.
    5. Inert gas purge for explosive or flammable materials.
    6. Flame arrestors
        1. Maintained regularly

3.1.6. INERTING AND PURGING SYSTEMS

1. Sources of inert or purge gas
    1. Inert gas generators
    2. Cylinders
2. Inert gas generator considerations
    1. Safety shutoff for flame out
        1. Monitor for completeness of combustion
        2. scrubber to remove contaminants
            1. Monitor for inert gas quality
        3. Cooler for hot gases
            1. Temperature monitor of exit gas stream
        4. Dryer to remove water vapor
            1. Monitor for completeness of water removal
        5. Method to maintain inert gas supply if system malfunctions (i.e., backup units)
3. Cylinder System considerations
    1. Proper manifolding to maintain pressure
    2. Methods to maintain supply while changing cylinders.
4. Purging systems
    1. Monitoring with combustible gas meters
        1. Keep below 25% of LEL
        2. Continuous recording of critical conditions.
    2. Alarm for approach of danger level
    3. Interlocks for automatic shutdown in case of failure.
    4. Effective distribution in vessels
    5. Pressure gage or monitor at inlet and outlet connections.
5. Inerting systems
    1. Oxygen concentration instruments in vessels.
        1. Many sampling points used for reading
    2. Continuous recording of critical conditions.
        2. Alarm for danger levels

3.1.7. MATERIAL HANDLING

1. These provisions applicable for:
    1. Railroad tank cars
    2. Tank trucks
    3. Barges
2. Raw material receiving, transfer and shipping.
    1. Use closed system if possible
    2. Performed by company or contract shipper
    3. Pressurized or inerted system
    4. Quality control testing to ensure purity
3. Contamination control
    1. Compatible materials
    2. Inerting
    3. Submerging reactive materials (such as sodium in kerosene).
4. Physical location
    1. Located so as to minimize risk of fire hazard.
        1. Approved electrical equipment
        2. No combustibles stored in area
        3. Smoking prohibited in transfer area
        4. Weed control
    2. Away from other important buildings
    3. Protected by automatic sprinklers
    4. Located on a level area
    5. Located outdoors if possible or pumps housed in separate pump houses.
5. Transferring methods
    1. Excess flow valves
    2. Overflow protection
        1. For low flash point liquids (0 F or lower), pipe to storage tank, otherwise pipe to supply source or suction side of pump.
        3. Level alarms
        4. Check valves to prevent back flow
        5. Automatic shutdown of flow (especially for gravity transfer systems; shutoffs should be located as close to supply as possible)
        6. Properly calibrated and maintained flow meter.
        7. Vacuum protection
        8. Minimize temperature differential between liquids to be mixed.
        9. Unload through top of containers
        10. Avoid use of metal flexible hose and metal-reinforced rubber hose, use steel pipe with swing joints.
        11. Use positive displacement pumps whenever possible placed above top of liquid level to be pumped.
        12. Hydraulic .systems must be designed in accordance with ASME code for unfired pressure vessels.
        13. Ensure heating lines have temperature regulators.
6. Connecting or disconnecting procedures
    1. SOPs for loading/unloading
    2. Depressurizing or venting
    3. Compatible transfer hoses
    4. Proper PPE
    5. Procedures to prevent truck or tank car movement.
    6. Provisions for spill cleanup in immediate area
    7. Fire extinguishers in immediate area
    8. Grounding and purging

3.1.8. PIPING SYSTEMS

1. Design criteria
    1. According to code (ANSI B31 series)
    2. Stress analysis for thermal expansion
    3. Proper material of construction for pressure, temperature, and material to be handled.

2. System construction and support
    1. Protected against physical damage
    2. Proper support for vibration
    3. Freedom for expansion and contraction
    4. Sloped to drain, drain valves located at low points
    5. Use of expansion-type bellows minimized and if used supported properly.
3. Heat tracing specified where liquid freezing is possible.
    1. Restricted to prevent exothermic decomposition.
    2. Prevent dryout or choking of Pressure Relief Devices(PRD).
    3. Corrosive chemical reaction prevented.
    4. Plant check list for precautions to be taken.
    5. Pressure relief
4. Fire Protection
    1. Flame arrestors or detonation arrestors provided.
    2. Sprinklers on pipe racks
    3. Remote shutoff valves for emergency shutdown.
5. Contamination Control
    1. Periodic inspection of steam traps to remove rust and scale.
        1. Installation of bypass around steam trap to allow blow down.
        2. In-line filters
        3. Tight, leak-free piping
        4. Methods of preventing back-flow (i.e.,check valves).
        5. Means of identification of material in pipes
        6. Testing after installation for leaks.

3.1.9 VALVES

1. Main shut-off valves labeled to indicate open or closed position and located in safe areas.
2. Manual valves located in a safe location.
3. Gate valves not used as block valves.
4. Avoid cast iron where possible in critical hazardous service (prohibited by ANSI B31 for flammables, toxins, and systems subject to strain).
5. Bleed valve provided between double block valves.
6. Interlocked or double block and bleed valves at critical locations to control leaking.

3.1.10.COOLING TOWERS

1. Sprinkler/fire protection
2. Vibration alarms or interlocks for fans
3. Hydrocarbon detector at high point in cooling water return line to detect heat exchanger leakage.
4. Two staircase totally enclosed with fire resistant material.
5. Communications on tower.

3.1.11.CONTROL ROOMS

1. Located in a safe area
2. Explosion resistance construction, adequate barricading if necessary.
    1. Minimize window area
    2. Use shatter-resistant glass
3. If exposed to fire, explosion, or toxic material hazard.
    1. Noncombustible, pressure resistant construction.
    2. Self-closing 1-hour fire resistance access doors.
    3. Kept under positive pressure with fresh air taken from a safe location and toxic/combustible gas alarm on air intake with quick acting, automatic alarm shutoff.
    4. Back-up air supply or airline respirators for critical personnel,escape respirators for critical personnel.
    5. No heavy equipment or machinery located on roof or control room.
    6. No toxic or flammable materials brought into control room through sensing lines.
4. Control panels
    1. Critical controls located in an easy to read location.

2. Each control clearly labeled to indicate function.
    1. Means for testing indicator light bulbs..
3. Use recorders rather than indicators when rate of change must be measured.

3.1.12.PROCESS SEWERS

1. Closed systems for hydrocarbon and waste streams.
    1. Discharge to sump for liquor recycling
    2. Sumps vented to destruct system
2. Maintained separate from public sewers
3. Sewer section should have traps
4. Sewer lines containing flammables should be kept full to avoid propagation of explosion or flange through vapor space.

3.1.13.UTILITIES

1. Emergency generator backup for power failure.
    1. Generator tested regularly
2. Fuel tank topped off after each test-run.

3.2. SPECIFIC PRESSURE AND REACTOR VESSEL CONTROLS

3.2.1. PRESSURE VESSELS AND REACTORS

1. Design criteria
    1. ASME Pressure Vessel Code, Section VIII
    2. Protection from external fire source
    3. Protection from internal runaway reaction
        1. IRI Nomograph
    4. Protection from internal overpressurization.
        1.Considerations of two-phase flow while relieving pressure.
            1. DIERS
            2. Actual system testing
    5. Protection from corrosion
        1.Special linings or materials of construction
        2. Protective coatings or linings
        3. Cathodic Protection
2. Inspection and maintenance
    1. In Accordance with applicable codes:
        1. National Boiler and Pressure Vessel Code.
        2. ANSI/API Std. No. 510
3. Diking and drainage
    1. Ditches Properly lined
4. Fire Protection systems
    1. Blast walls or barricades
    2. Explosion suppression systems
    3. Fixed monitors
    4. Deluge systems
    5. Automatic sprinklers
    6. Inerting and Purging
    7. Maintenance of adequate spacing between units.
5. Other Pressure Vessel and reactor components
    1. Sample ports and QC sampling
        1. Minimize or eliminate flushing of sample line prior to sample withdrawal.
            1. Circulation loop samplers
            2. Sample bombs
            3. Bleed-off sampling
        2.Prevent employee exposure to sampling port.
            1. Enclosure of sample port
            2. Closed sampling system
    2. Seals and gaskets
        1. Compatible with process material

2. Checked regularly for leaks
3. Exterior Fittings
   1. Separate for different types of service (i.e., water and nitrogen).
4. Agitators
   1. Is stirrer large enough for the job
   2. Poser supply monitored
5. Overhead Condensers
   1. Water flow rate monitored
   2. Temperature change monitored
6. Vibration
   1. Monitored on regular basis
7. Pressure, temperature, flow or level instruments.
   1. Alarmed
   2. Controller or indicator only
   3. Calibrated frequently
8. Pressure relief devices (ASME VIII, Par. UG 125-132)
   1. General
      1. Venting to a destruct system or a safe location where employee cannot be exposed.
      2. Rated properly for system (no more than 10% above the MAWP)
         1. Properly maintained to keep in good working order and free of corrosion or fouling.
         2. In line shutoff valve locked in open position.
         3. Installed close to equipment in vertical position.
         4. Set and sealed at proper relieving pressure.
         5. Prevented from plugging due to solids or polymer buildup.
   3. Rupture disks
      1. Installed facing correct way
      2. Proper type for intended service
      3. Flange screws torqued to proper tightness.
      4. Frequent inspection and maintenance
      5. Inert gas stream to prevent buildup of solids or polymers on disc.
      6. Outlet pipe diameter same size as disc diameter.
   4. Combinations
      1. If pressure relief device (PRD) and rupture disk (RD) are used in series, the space between the two must be vented to the atmosphere or monitored for pressure buildup.

3.2.2. INSTRUMENTATION

1. Design criteria
   1. Controls clearly labeled for purpose
   2. Installed for easy inspection and maintenance.
   3. Intrinsically safe or enclosed and purged where required.
   4. Critical measurements recorded rather than indicated.
   5. Sufficient range to monitor both normal and abnormal conditions.
      1. Adequate number used to monitor conditions.
   6. Measure actual process conditions
      1. Multiple thermocouples for temperature
      2. Rate of temperature rise
      3. Flow rate rather than pump energy usage or time operated.
      4. RPM's rather than agitator current usage.
   7. Emergency controls and interlocks separate from process controls.
2. Fail-safe
   1. General considerations
      1. Instrument signal lines (i.e., electrical, optical, pneumatic) protected against premature failure (i.e., leaks, adverse weather conditions)
      2. Self-closing valves on vessels containing flammable liquids.
   2. Sight glasses
      1. Protected with metal shield

2. Check valves at each end to prevent material leakage.
3. Reliability
   1. Typical service life established for controls.
4. Safety considerations
   1. Remote shutoffs or hazardous locations
5. Interlocks
   1. Activate alarm or shutdown equipment
   2. Written and sign-off procedures for bypass.
   3. On-line testing program
   4. Start-up procedures
6. Alarms
   1. Secured against being disarmed by operators.
7. Backup power and other utilities
8. Protected from fire and corrosion
9. Periodic inspection, maintenance and calibration.
   1. Special provisions when instrument must be taken out of service.

3.3. SPECIFIC UNIT CONTROLS

3.3.1. PUMPS, COMPRESSORS AND TURBINES (ROTATING EQUIPMENT).

1. General
   1. Use of double sealed, submerged or canned equipment for highly flammable or toxic chemicals.
      1. Compatible buffer between seals or monitoring.
   2. Gas engines
      1. Ignition source
      2. Lubrication
      3. Automatic shutdown
         1. Low lubricating oil
         2. Overspeed
         3. High temperature
      4. Remote shutdown
      5. Backflow protection
      6. Pressure relief
         1. Vent to a safe area
         2. Adequate rating for downstream piping
      7. Vibration damping
      8. Adequate cooling/venting of exhaust gases
   3. Lubrication systems
      1. Filters to maintain clean oil
      2. No block valves in filtering system
      3. Separate lubricating oil systems on critical equipment.
      4. Non flammable synthetic lubricants for air compressors.
         1. Potentially toxic
   4. Drain valves
   5. Seals and gaskets
      1. Monitoring for leaks
      2. Compatible with process materials
   6. Alarms
      1. Temperature rise in case of blocked outlet.
      2. High downstream pressure
      3. Loss of cooling
   7. Adequate steam traps on steam supply lines
   8. Adequate ventilation for hydrocarbon PULP houses.

3.3.2. CONTROL VALVES

1. Fail safe
2. Stop input of reactants
   1. Closing slow enough to prevent water-hammer.

3. Emergency air or nitrogen supply for continued operation of critical valves in case of loss of plant utilities.

3.3.3. DISTILLATION COLUMNS

1. Reboilers
    1. Temperature Monitoring
        1. Temperature control interlocked to steam line and redundant.
        2. Or differential pressure controller from top and bottom of column.
    2. Monitor skin temperature of tubes on indirect fired systems.
2. Condensers
    1. Level indicator and controller
    2. Overflow prevention
3. Feed Lines
    1. Flow controller interlocked with steam lines.
    2. Column level controller interlocked to feed.
4. Reflux
    1. Flow switch to monitor and maintain proper reflux radio.
5. Vacuum systems
    1. Methods to prevent loss of vacuum in emergency.
    2. Procedures for slowly cooling and returning to atmospheric pressure at shutdown.
    3. Cracking and maintenance of seals and gaskets.

3.3.4. CENTRIFUGES

1. Effective inert gas blanketing when handling flammables.
2. Prevention of reverse rotation on basket systems to avoid damage by snubber.
3. Exhaust air drawn from sealed receiver while manually removing solids to prevent inhalation exposure hazard.
4. Proper mounting and vibration damping
    1. Use flexible or welded rather than flanged joints where possible.
5. Area around centrifuge designed for spill containment in case of leaks (i.e., seal failure).

3.3.5. FILLING AND PACKING EQUIPMENT

1. Local exhaust ventilation at discharge ports where materials present a health, fire or explosion hazard.
2. Overflow protection
    1. Automatic shutdown after predetermined weight or volume dispensed
    2. Area diked to contain spills from possible overflow.
3. Increase particle size to decrease "dusty" operations by the following:
    1. Prilling
    2. Tableting
    3. Pressure rolling
    4. Extrusion
    5. Molding
    6. Agglomeration tumbling

3.3.6. HEAT EXCHANGERS AND HEAT TRANSFER SYSTEMS

1. Equipment suitable for heat transfer medium used and temperature,pressure extremes anticipated.
2. Establish safe limits of operation
    1. Instrumentation and control equipment provided to insure safe limits of operation are not exceeded.
3. Provide automatic fire protection systems where flammable liquids or liquefied flammable gases are present.
4. Organic heat transfer media recommendations:
    1. Heat transfer medium
        1. Flashpoint above 250 F.
        2. Avoidance of chlorinated organic media.
            1. Liberates HCl upon decomposition
            2. Presents serious corrosion problems.

2. System vaporizers or heaters
    1. Located in cutoff room or separate building.
    2. Automatic control regulated by temperature and pressure elements at outlet.
    3. Separate safety switches for automatic shutdown in case of:
        1. Low vaporizer liquid level
        2. High vapor pressure or temperature
    4. Steam or inert gas smothering system for vaporizer or heater fire box for fires in case of heat transfer medium leakage.
    5. Approved combustion safeguards and fuel safety shutoff valves for:
        1. Flame failure on gas and oil burners.
3. Relief valves
    1. Materials of construction
        1.All steel construction
        2. Special heat resistant springs
    2. Installed on:
        1. Vaporizers
        2. Positive displacement cups on condensate return.
        3. Discharge to safe location
        4. Hartford Loop incorporated in the condensate line of vapor-phase heating equipment having a gravity return.
        5. Precautions with insulation
            1. Install valve stems in horizontal position so leaks drip away from insulation.
            2. Cover insulation in areas of potential leaks with oil resistant cement.
            3. Use nonabsorbent type insulation
            4. Remove or replace oil soaked insulation.
        6. Inspection and testing
            1. Samples of heat transfer medium tested on regular basis for impurities.
            2. Periodic checks for incipient tube failure.

D. FOURTH TASK - Emergency Response Procedures.

The fourth task is to evaluate the emergency response system that is embedded in the operating system. Conceptually, this is a latent system that is active only when normal operational control systems have failed and an incident has occurred. This system is the most difficult to evaluate because:

1. It is not observable except in emergencies.

2. The emergency response system may also involve resources and systems that lie wholly or Partially outside of the Physical or managerial boundaries of the plant. For example, local fire fighters may supplement in-plant fire brigades; local hospitals may provide care to injured workers in addition to in-plant first aid; local police may be involved in traffic control, evacuation of workers and community and with expediting communications and flow of emergency and rescue equipment

3. There is the question of defining the point at which the emergency system "shuts down" and normal operations begin after an emergency.

Assessing the adequacy of a written emergency plan is an art, not a science. It involves judgment as to the reasonableness of the assumptions underlying the plan (i.e. what is a reasonable work case estimate) as well as the counter measures designed to protect life and to limit environmental and property damage. A detailed outline has been provided a the end of this section which covers specific items which should be addressed in a comprehensive plan. The need for such a detailed plan must be determined by the compliance officer based on the hazard potential of the chemicals involved and the programs and controls in effect at the plant to reduce this potential.

4. EMERGENCY RESPONSE PROCEDURES

4.1 WRITTEN EMERGENCY PLAN ELEMENTS

4.1.1. FORMAT
1. Statement of priorities
2. Safety of plan personnel and the public
3. Control of hazards
4. Minimizing damage to property
5. Practical
6. Simple
7. Easy to understand
8. Deals with any type of emergency
    1. Fire and explosion
    2. Release of highly toxic materials
    3. Large chemical spills
    4. Acts of nature
    5. Power failure
    6. Sabotage including bomb threats, etc.
    7. Inclement weather
9. Updated periodically
    1. Annually
    2. Whenever processes, materials, procedures or key personnel change.
    3. Changes distributed to those with a need to know.
10. Impact on unaffected plan operation
    1. Incoming feed materials and process streams.
    2. Downstream process and storage systems
    3. Waste disposal systems
    4. Fuel supplies and other utilities

4.1.2. DECISION LOGIC CHARTS
1. Assists in making informed decision on evacuation
2. Available to supervisors on each shift
3. Plant evacuation
    1. Assist in making informed decision on evacuation.
    2. Provides local authorities with information on evacuating community.
4. Selection of protective clothing
5. Selection of respirators
6. Emergency shutdown of equipment
    1. Critical personnel protection
    2. Equipment which must function even in emergencies.
    3. Methods to bring equipment to minimum energy states.

4.1.3. EVACUATION PLANS
1. Written evacuation plan
    1. Included in overall emergency program
    2. Condensed instructions
    3. Employee duties
    4. Covers all shifts
2. Evacuation routes
    1. Inside and outside plant routes coordinated with local officials
    2. Employers and local populace informed of routes.
    3. Primary and alternate routes determined and indicated in plan.
    4. Designated safe areas for regrouping for employees.
        1. Cross wind from contaminant source.
        2. At a "safe distance" from danger zone
        3. Known by employees
        4. Restrictive topographical conditions considered.
        5. Designated evacuation wardens to account for personnel and to report on medical condition of those present and the names of those missing.
        6. Dispersion modeling
            1. Minor to worst case scenarios

2. Input on prediction of temperature, inversion levels, and other meteorologic conditions that could effect toxic gas concentrations from local weather bureau.
3. Calculates concentration down wind
4. Used as employee training tool
5. Used to activate alarms
6. Trigger levels of toxic or flammable materials.

3. Communications to evacuate employees to a safe location.
   1. Alarms and signals easily heard and understood by employees.
   2. Procedures for critical operations and personnel.
   3. Provisions made to evacuate visitors and handicapped personnel.

4.1.4. FIREFIGHTING AND RESCUE TEAMS

1. Fire brigades
   1. Implemented, trained, and equipped. according to 29 CFR 1910.156.
   2. Availability of fire fighting equipment
   3. Mutual aid equipment compatible with plant systems.
2. Rescue teams
   1. Proper PPE
   2. Knowledge of evacuation routes,utility shutdown, first aid, use of communication equipment and mobile equipment.

4.1.5. EMERGENCY DRILLS OR SIMULATIONS

1. Involves all members of the response team including public agencies.
2. Responses reviewed to determine areas where improvement is needed.
3. Results of the drill evaluations communicated to the employees.
4. Drills conducted for all shifts
5. Routine, periodic checking of equipment and supplies.

4.1.6. SPILL AND RELEASE CONTROL PLANS

1. containment
2. Neutralization
3. Disposal
4. Proper PPE

4.2. CONTROL AND COORDINATION

4.2 1. COMMUNITY INTERFACING

1. Emergency response plan developed with community leaders.
2. Prior consideration/coordination of all potential groups or agencies such that there will not be loss of control due to over- or under-response?
3. Local personnel brought on site periodically for training and familiarization with plant and its hazards.
4. One trained person designated on each shift to take initial action necessary to minimize the emergency and to coordinate all efforts.
5. Designated spokesperson to interface with media and to coordinate with other responding groups.

4.2.2. EMERGENCY CONTROL CENTER

1. Establish in a safe location
   1. Structural integrity
   2. Emergency support systems
      1. Toxic and flammable monitors and alarms.
         1. Proper maintenance and testing
         2. Wind speed and direction
         3. ventilation
         4. Emergency breathing air
         5. Lighting
         6. First aid
         7. Water and food

8. Power generators
9. Escape PPE including respirators (i.e., SCBA).

3. Restricted access

2.Communications
1. Outside and plant phone lines
2. Portable radios
3. Backup systems

3.Plant records
1. Site map
2. Topographical maps
3. Building layouts
4. Flow charts and P&ID's
5. Blueprints
6. Lists of raw materials, intermediates and products MSDS's.
7. Personnel rosters and call out plans.
8. Organizational charts

4.Emergency.service listings
1. Fire, police, medical, environmental, mutual aid, community emergency response groups, spill and release response groups.

4.2.3. SAFETY COMMITTEE OVERSIGHT
1.Committee consists cf employee representatives and management.
2.Performs plant audits
3.Receive feedback on action taken relative to their recommendations.

4.2.4. PLAN DISTRIBUTION
1. All key plant personnel
   1. Management and supervisors
   2. Employees or their representatives
   3. Switch board operator
   4. Emergency response personnel
2. Local police officials
3. Fire officials and paramedics
4. Local government
5. Hospitals and physicians
6. Participating mutual aid companies
7. Utility companies

4.3. TRAINING.
1. Plant personnel
   1. New employees
   2. Job transfers
2. Training evaluation methods
3. Supervisor involvement in training
4. Periodic updating
5. Review of emergency plan for their area
6. Recognition of early warning signs of hazards
   1. Unusual odors or sounds
   2. Signs and symptoms of exposure
   3. Unusual vessel temperatures and pressure'
   4. Leaks
   5. Excessive vibration
   7. Personal protective Equipment to be worn
   8. Evacuation routes
      1. Alarm systems
      2. Safe assembly points
      3. Return signals
      4. Non-plant personnel safely evacuated

9. Visitors and outside contractors
    1. Alarm systems
    2. Evacuation routes and assembly points
    3. Responsible plant person
        1. Follow directions

4.4. REENTRY AND CLEANUP.

1. Determination of Site Safety
    1. Air monitoring for safe levels
    2. Contamination of equipment
    3. Unstable or hazardous chemical residues
    4. Unstable structures or "booby traps" present from the incident.
    5. Pressure in pipes, vessels, containers, and bumps.
2. Employee training and protection
    1. Proper clothing and respiratory protection.
    2. Decontamination procedures for equipment and personnel.
    3. Qualifications for cleanup tasks

Appendix D

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Appendix E

Dear Employer:

The Bhopal tragedy and other chemical related catastrophes have raised significant concern about the safe handling, production and use of chemicals.

A representative from the Occupational Safety and Health Administration has completed an inspection at your workplace, and has determined that your workplace might benefit from a "process safety audit review". The information gathered pertaining to the production, use and handling of chemicals in your workplace will be reviewed for possible scheduling of a process review inspection.

The attached information outlines the questions and issues that are used by OSHA during process reviews. We strongly recommend that these guidelines be integrated into your existing internal audit programs. The use of process review type audits has yielded significant improvements in safety and health programs across a wide range of industries.

Also attached is a "List of Extremely Hazardous Substances" as defined by the Environmental protection Agency. We suggest that you contact the Environmental protection Agency or its State designee to determine whether you are complying with requirements under their authority which address Emergency Planning Community Right to Know relative to the chemicals present at your facility.

Please feel free to contact me if I can be of assistance.

OSHA Instruction REP.1

November 18, 1991
Office of Human Resources and Organizational Management

Subject: OSHA Metric Program

A. PURPOSE. This instruction establishes policies and assigns responsibilities for implementing the metric system of measurement within the OSHA.

B. SCOPE. This instructions applies to all offices throughout the OSHA.

C. ACTION. Program Directors, Regional Administrators and Office Directors, in coordination with appropriate officials,shall initiate all actions necessary to implement this instruction.

D. BACKGROUND.

1. The Metric Conversion Act of 1975 stated that the policy of the United States shall be to coordinate and plan the increasing use of the metric system in the United States.

2. On August 23, 1988, the President signed the Omnibus Trade and Competitiveness Act (OTC Act) of 1988, which amended the Metric Conversion Act of 1975 to declare:

a. That the metric system of measurement is the preferred system of weights and measures for United States trade and commerce;

b. That each Federal agency, by a date certain and to the extent economically feasible by the end of fiscal year 1992, will use the metric system of measurement in its procurements, grants and other business related activities (unless metric usage is impractical or would have an adverse impact on the market share of U.S. firms); and

c. That agencies will seek out ways to increase understanding of the metric system of measurement through educational information and guidance in Government publications.

3. On July 25, 1991, the President signed Executive Order 12770, Metric Usage in Federal Government Programs, to implement the metric provisions of the OTC Act.

E. DEFINITIONS.

1. METRICATION. Any activity that increases the use of the metric system, including metric training and initiation or conversion of measurement-sensitive processes and systems to the metric system.

2. METRIC SYSTEM. The International System of Units of the International Bureau of Weights and Measures. The units are listed in Federal Standard 376A, Preferred Metric Units for General Use by the Federal Government.

F. POLICIES.

1. The OSHA will implement the metric system in a manner and on a schedule consistent with the Omnibus Trade and Competitiveness Act of 1988.

2. OSHA Program Directors, Regional Administrators, and Office Directors will use the metric system in rulemaking, procurements, grants, and other business-related activities considering security, operational,economic, technical, logistical, training, and safety requirements.

3. The OSHA will encourage industry in the change to the metric system by acquiring commercially available metric products and services that meet the functional requirements of the OSHA and its customers, so long as competition is maintained.

4. Specifications and standards for OSHA rules and procurements will be developed in metric unless metric usage is not practical or would have an adverse impact on the market. Commercially developed metric specifications and internationally or domestically developed voluntary standards using metric will be adopted whenever possible.A dual system will be used where metric alone is not practical or appropriate.

5. Measuring devices and shop and laboratory equipment should be procured in metric or dual units when possible.

6. Metric conversion costs will be handled in the OSHA as normal operating expenses rather than as special one-time costs. However, these costs are to be identified to the extent practicable. This includes the cost of metric aids, tools, equipment, and training. Significant cost savings resulting from metric conversion also should be identified to the extent practical.

7. The OSHA will establish training plans and practices that increase employee awareness and understanding of metric system conversion.

G. COORDINATION WITH THE PRIVATE SECTOR. Because the private sector has an essential role in the transition to the use of metric measurements, its needs and capabilities must be considered along with those of the Federal Government. The U.S. Metric Association (USMA) and the American National Metric Council (ANMC) traditionally have been regarded as the principal representatives of private sector metric interests,plans, and conversion action. Federal agencies, including the OSHA must work closely with the USMA and ANMC to aid in exchanging ideas, plans, and methods needed to fulfill the intent of the OTC Act. Coordination with other private sector organization involved in metrication activities also may be beneficial.

H. RESPONSIBILITIES.

1. The Director of Administrative Programs will:

a. Ensure the OSHA's implementation of the OTC Act.

b. Represent the OSHA on DOL committees.

c. Establish OSHA policy for the use of metric system measurement and approve or disapprove deviations from that policy.

d. Ensure appropriate OSHA representation on authorized committees.

e. Appoint the OSHA Metric Coordinator to represent the OSHA on metrication committees.

2. The OSHA Metric Steering Group representing Directorates and top-level Offices with primary responsibility will formulate metric policy for the approval of the Assistant Secretary for the OSHA.

3. The Directorate of Federal and State Programs will identify and coordinate appropriate metrication training programs for OSHA employees.

4. The Office of Information and Consumer Affairs will:

a. Advise, clear, coordinate, and assist in the production of all publications and audiovisuals proposed by the OSHA offices to inform the public and other government agencies of new uses of the metric system in OSHA programs.

b. Devise and implement economical, effective means for informing OSHA employees of new uses of the metric system within the agency and for increasing employee understanding of the metric system of measurements.

5. The Office of Program Budgeting, Planning and Financial Management will include in annual budget submission to the Congress the OSHA's progress in its implementing the metric system pursuant to section 12 of the OTC Act (see paragraph 10).

6. Program Directors, Regional Administrators, and Office Directors will:

a. Appoint an official as their Metric Coordinator to monitor metric conversion activities for which they are responsible;

b. Develop metric guidelines applicable to their specific mission and responsibility. Guidelines will be consistent with this instruction, the "Metric Handbook for Federal Officials" (available from the National Technical Information Service) regarding the selection of proper metric units and symbols, and guidelines and interpretations developed by the OSHA Metric Steering Group.

I. REPORTING.

1. OSHA Program Directors, Regional Administrators and top level Office Directors shall submit to the Director of Administrative Programs by November 1 of each year, a report for the past fiscal year including:

a. Significant metric information milestones or accomplishments;

b. Significant problems encountered in metric conversions;

c. Any recommendations regarding OSHA metric program policy or activities, including actions planned for the current fiscal year to further implement the metric system; and

d. Other relevant information.

2. The OSHA Metric Coordinator shall consolidate the above reports into an annual OSHA Metric Report. This report shall be submitted for approval to the Assistant Secretary for the OSHA by December 1 of each year.

3. The Director of Administrative Programs will present the final report to the DOL Comptroller by December 31 of each year for submission to the Congress as part of the annual budget following section 12 of the OTC Act.

4. The reporting shall cease one year after full implementation by the OSHA of the metric system.

J. PROGRAM OPERATION.

1. The OSHA Metric Program will be operated through a Metric Steering Group, chaired by the Director of Technical Support, and shall include a Metric Coordinator from each Program Directorate and top level Office. General guidance for the OSHA Metric Steering Group will be provided by the Director of Technical Support as necessary.

2. The OSHA Metric Steering Group will meet as necessary to assist in achieving a uniform and coordinated approach to implementing the requirement of the OTC Act. Guidelines and interpretations will be developed by the group.

OSHA Instruction STD 1-1.11

APR 26, 1982

Subject: The alternating Tread Type Stair

A. Purpose. This Instruction recognized a newly developed alternating treat type stair not presently covered by existing OSHA standards.

B. Scope. This Instruction applies OSHA-wide.

C. Action. OSHA Regional Administrators/Area Directors shall take action to ensure that employers using alternating tread type stairs comply with the guidelines in E. of this Instruction.

D. Federal Program Change. This Instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this change is forwarded to each State designee.

2. Explain the technical content of the change to the State designee as requested.

3. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing, within 30 days of notification, to the Regional Administrator. This acknowledgment should include a description either of the State's plan to implement the change or of the reasons why the change should not apply to that State.

4. Review policies, Instructions and guidelines issued by the State to determine that this change has been communicated to State program personnel. Routine monitoring activities (accompanied inspections and case file reviews) shall also be used to determine if this change has been implemented in actual performance.

E. Guidelines. Currently OSHA has no standards relating to the alternating tread type stair. In order to provide safety for employees who might use such stairs, it must be designed, installed, used and maintained in accordance with the manufacturer's recommendations and in accordance with the following requirements:

1. The stair will be installed at a 70-degree angle or less.

2. The stair shall be capable of withstanding a minimum uniform load of 100 pounds per square foot with a design factor of 1.7 and the treads shall be capable of carrying a minimum concentrated load of 300 pounds at the center of any tread span or exterior arc with a design factor of 1.7. If intended for greater loading, construction shall allow for that loading.

3. The stair shall be equipped with a handrail on each side to assist the user in climbing or descending the stair.

F. Background. The Directorate of Safety Standards Programs will propose standards for the alternating tread type stair when the Subpart D Proposal is published in the Federal Register. Based on a National Office review, it appears that if the stair meets the design requirements in E. of this Instruction and is properly installed, used and maintained, it meets the intent of the Act.

OSHA Instruction STD 1-3.2

March 21, 1979
Office of Compliance Programming

HAZARD ALERT

SUBJECT: Hunt-Pierce Servi-Lift #9-271 Aerial Lift

A. Purpose. This Instruction requires that the six torque plate bolts which hold the torque plate that joins the upper and lower booms of the Servi-Lift must be in place and properly secured.

B. Scope. This Instruction applies OSHA-wide.

C. Action. CSHO's during inspections shall ensure that any missing or loose torque plate bolts is a recognized hazard and shall be corrected immediately.

D. Background. It has been brought to OSHA's attention that a problem could exist for employees working in and around the Hunt-Pierce Servi-Lift #9-271 aerial lift. Serious accidents may occur because of inadequate and/or improper preventive maintenance routines coupled with insufficient daily inspections of the equipment by its operators and its maintenance team to insure safe operation.

OSHA Instruction STP 2-1.149

August 29, 1988
Office of State Programs

Subject: Concrete and Masonry Construction Safety Standards, Final Rule.

A. Purpose. This instruction describes a Federal Program change to the Regions and State designees.

B. Scope. This instruction applies OSHA-wide.

C. Federal Program Change. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this instruction is forwarded to each State designee.

2. Provide a copy of the Federal Register notice to the State designee upon request.

3. Explain the technical content of the Federal Register notice at 53 FR 22612, June 16, 1988, Concrete and Masonry Construction Safety Standards, to the designee upon request.

4. Ensure that each State designee acknowledge receipt of this instruction in writing, within 30 days of notification, to the Regional Administrator. The acknowledgment should include (a) the State's plan to adopt and implement the standard change, (b) the State's plan to develop an alternative change, which is as effective, or (c) the reasons why no change is necessary to maintain a program which is as effective.

5. Inform each State designee that the State must amend the State's standard to ensure that it remains at least as effective as the amended 29 CFR 1926.700-.706 and submit a plan supplement within 6 months of the date of Federal publication.

D. Different Standards. Section 18(c)(2) of the OSH Act requires that State standards be "at least as effective" as the Federal and, when applicable to products used or distributed in interstate commerce,be required by compelling local conditions and not unduly burden interstate commerce. In addition to the "at least as effective" criterion,this "product clause test" will be applied to State standards with substantively different requirements from the comparable Federal standard, as described in STP 2-1.117. A State standard expanded in scope from the Federal is considered to be a substantively different standard.

E. Interim Enforcement. Under 29 CFR 1053.23(a) and (b), State plan States are provided up to 6 months from publication of the Federal standard in the Federal Register to promulgate an identical or "at least as effective" as standard. If a State, for whatever reason, is unable to promulgate a standard in a timely manner (6 months for a permanent standard, 30 days for an emergency temporary standard) the State shall be expected to provide assurance that it will enforce the substantive provisions of the new or revised Federal standard through such means as use of its general duty clause or equivalent, temporary adoption of an identical standard, or an alternative, specified enforcement mechanism.

F. Explanation:

1. On June 16, 1988 OSHA issued a final rule on its standard for Concrete and Masonry Construction Safety (53 FR 22612). That action revised OSHA's safety standards for Concrete and Masonry Construction (formerly Concrete, Concrete Forms and Shoring) located in Subpart Q of 29 CFR Part 1926.

2. The rule corrected problems related to the existing regulation,including ambiguities, redundancies, and gaps in coverage Additionally, reference to the American National Standard A10.9-1970, "Safety Requirements for Concrete Construction and Masonry Work,"

has been removed and the applicable requirements from this standard and the more recent ANSI Standard for Concrete and Masonry Work, ANSI A10.9-1983, have been evaluated and used in developing the final rule. The revised rule is intended to reduce occupational fatalities and injuries in concrete and masonry construction work.

3. Under 29 CFR 1953.23(a) and (b), States are provided up to 6 months from publication in the Federal Register for adoption of parallel State standards and amendments.

OSHA Instruction STP 2-1.161

November 27, 1990
Office of State Programs

Subject: Concrete and Masonry Construction Safety Standards;Lift Slab Construction Operations; Final Rule.

A. Purpose. This instruction describes a Federal Program Change to the Regions and State designees.

B. Scope. This instruction applies OSHA-wide.

C. Reference. OSHA Instruction STP 2-1.117, August 31, 1984, State Standards.

D. Federal Program Change. This instruction describes a Federal Program Change which affects State programs. Each Regional Administrator shall:

1. Ensure that this instruction is forwarded to each State designee.

2. Provide a copy of the Federal Register notice to the State designee upon request.

3. Explain the technical content of the Federal Register Notice at 55 FR 42306, October 18, 1990, Concrete and Masonry Construction Safety Standards; Lift Slab; Final Rule, to the State designees upon request.

4. Ensure that each State designee acknowledges receipt of this instruction in writing, within 30 days of notification, to the Regional Administrator. The acknowledgment should include (a) the State's plan to adopt and implement the standard change, (b) the State's plan to develop an alternative change, which is as effective,or (c) the reasons why no change is necessary to maintain a program which is as effective as the Federal program.

5. Inform each State designee that the State must within six months of the date of Federal publication amend its final rule or adopt the final rule to ensure that the State standard is at least as effective as the Final Rule for Concrete and Masonry Construction in 29 CFR1926, Subpart Q. The State must submit a plan supplement to the Regional Administrator within 30 days of State promulgation.

E. Different State Standards. Section 18(c)(2) of the Act requires that State standards be "at least as effective" as the Federal and, when applicable to products used or distributed in interstate commerce, the standards must be required by compelling local conditions and not unduly burden interstate commerce. In addition to the "at least as effective"criterion, this "product clause test" will be applied to State standards with substantively different requirements from the comparable Federal standard, as described in STP 2-1.117. A State standard expanded in scope from the Federal list considered to be a substantively different standard.

F. Interim Enforcement. Under 29 CFR 1953.23(a) and (b), State plan States are provided up to six months from publication of the Federal standard in the Federal Register to promulgate an identical or "at least as effective" as standard.If a State, for whatever reason, is unable to promulgate a standard in a timely manner (six months for a permanent standard, 30 days for an emergency temporary standard) the State shall be expected to provide assurance that it will enforce the substantive provisions of the new or revised Federal standard through such means as use of its general duty clause or equivalent, temporary adoption of an identical standard, or an alternative, specified enforcement mechanism.

G. Effective Date. The final rule becomes effective on December 17, 1990. The initial effective date for an identical or different State standard may be no later than the date of State promulgation or the Federal effective date, whichever is later.

H. Explanation:

1. On October 18, 1990, OSHA issued a final rule amending 29 CFR 1926, Subpart Q.

2. This rule revises OSHA's Safety Standards for Lift Slab Construction Operations. This rule making updates specific requirements for lift-slab construction operations that were incorporated by reference in the existing standard from the American National Standards Institute's (ANSI) Safety Requirements for Concrete Construction and Masonry Work, ANSI A10.9-1970, and adds new requirements to provide additional protection for workers engaged in lift-slab construction operations.This revision eliminates ambiguities caused by incorporating the ANSI standard by reference and strengthens the lift-slab requirements by eliminating weaknesses or gaps in coverage that existed through the reference to the outdated ANSI standard.

3. Under 29 CFR 1953.23(a) and (b), States are provided up to six months from the publication in the Federal Register for adoption of parallel State standards and amendments.

OSHA Instruction STP 2-1.132

NOV. 24, 1986
Office of State Programs

SUBJECT: Recordkeeping Requirements for Tests, Inspections, and Maintenance Checks

A. PURPOSE. This instruction describes a Federal Program change to the Regions and State designees.

B. SCOPE. This instruction applies OSHA-wide.

C. FEDERAL PROGRAM CHANGE. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that this instruction is forwarded to each State designee.

2. Provide a copy of the Federal Register notice to the State designee upon request.

3. Explain the technical content of the Federal Register notice at 51 FR 34552, September 29, 1986, Recordkeeping Requirements for Tests, Inspections, and Maintenance Checks, to the State designee upon request.

4. Inform each State designee that the States are encouraged to revise certain provisions in their recordkeeping requirements, comparable to Federal requirements, to minimize paperwork burdens imposed on employers.

5. Ensure that each State designee acknowledges receipt of this instruction in writing, within 30 days of notification, to the Regional Administrator. The acknowledgment should include (a) the State's plan to adopt and implement the revision, (b) the State's plan to adopt an alternative revision, which is as effective, or (c) the State's notice that it will not adopt the revision. If the revision is adopted, a plan supplement should be submitted to the Regional Administrator as soon as possible, but in no case later than 6 months from issuance of this instruction.

D. EXPLANATION.

1. The Occupational Safety and Health Administration has revised certain recordkeeping requirements to minimize the paperwork burdens imposed on employers.

2. This final rule eliminates certain requirements under which an employer must prepare and maintain detailed records. The revised provisions require, instead, that the employer prepare a certification record, at the time the required work is done, which includes the date the test, inspection, or maintenance check was performed; the signature of the person who performed the work; and the identity of the equipment or machinery that was inspected or tested. The Agency has determined that the certification statement will provide evidence of compliance which is equivalent to preparing and maintaining records to be presented to OSHA upon request. In addition, OSHA is revoking two recordkeeping requirements.

3. OSHA has determined that the implementation of this final rule will minimize the paperwork burden on employers, as required by the Paperwork Reduction Act of 1980, without reducing the protection of employee safety or health.

Standard Number	Record ID		Volume and Page No.
1904.			
2	STD	3-1.1	1-1
2(a)(1)		1283	1-4
2(a)(1)		1338	2-462
2(a)(1)		1343	1-12
2(a)(1)		1400	1-13
2(a)(1)		1453	1-172
2(a)(1)		1603	1-7
2(a)(1)		1886	1-5
2(a)(1)		4126	1-7
2(a)(1)		4514	1-179
2(a)(2)		1176	1-9
2(a)(2)		1885	1-10
2(a)(2)		4497	1-176
2(b)		91122001	1-15.5
2(b)(2)		91122001	1-15.5
5(a)		91122001	1-15.5
12	STP	2-1.111	1-15.1
12	STP	2-1.135	1-15.2
12(c)(3)		1886	1-5
1904.12(c)(3)		3378	1-15
12(c)(3)		D93040102	1-15.4
12(g)(1)		91122001	1-15.5
14(b)		91122001	1-15.5
1910.			
1		1716	4-17
1(a)		92013001	1-21.3
3(b)(1)		D93080601	2-101.1
5(c)(1)		1368	3-594
5(c)(1)		1371	2-99
5(c)(1)		1431	3-458
5(c)(1)		1466	3-319
5(c)(1)		1855	2-166
5(c)(1)		92050801	1-412.88
5(c)(1)	STD	.2	3-298
5(c)(2)		1248	1-134
7(Appendix A)		3580	1-170
7(b)		1493	3-580
7(b)		3580	1-170
7(b)		4181	3-579
12(a)		D930227f	1-570.5
12(b)		1533	2-57
1910.12(b)		92041502	3-479.3
12(b)		92081401	2-564.94
12(b)		93012601	2-564.143
16(b)(2)(iii)		1721	1-166
20(b)		2333	1-23
20(b)(1)		1369	1-35
20(b)(3)		1369	1-35
20(c)(5)(ii)		2111	1-21
20(c)(6)(i)		1180	1-30
20(c)(6)(i)(B)		1244	1-33
20(c)(6)(i)(B)		2939	1-25
20(c)(6)(i)(B)		3058	1-34
20(c)(6)(ii)(D)		2111	1-21
20(c)(6)(ii)(D)		3039	1-26

Note: Record IDS may be linked to more than one Standard Number. However, the Record IDs are normally located after the principal Standard Number to which it applies. Therefore, a Record ID may be found behind more than one Standard Number. The page numbers listed above should always be used to locate the Record ID.

Standard Number		Record ID	Volume and Page No.
1910.20(d)(1)		1369	1-35
20(d)(1)		2939	1-25
20(d)(1)(i)		1399	1-31
20(d)(1)(i)(A)		1180	1-30
20(d)(1)(ii)		2933	1-32
20(d)(1)(ii)(B)		1920	3-238
20(d)(1)(ii)(B)		2283	3-155
20(d)(2)		1244	1-33
20(e)(1)		2283	3-155
20(e)(2)		1991	1-36
20(e)(2)(ii)(D)		3039	1-26
20(h)(1)		1399	1-31
20(h)(1)		3537	1-28
21(a)(1)		2038	1-50
21(a)(1)		2071	1-37
21(e)(2)		1393	2-180
22(a)(1)		1688	4-1
22(a)(1)		1691	4-2
22(a)(1)		3859	4-52
22(a)(2)		1688	4-1
1910.22(b)(2)	STD	1-1.4	1-38
22(d)(1)		1181	1-39
22(d)(1)		D9310058	1-39.1
23	STD	1-1.1	1-40
23(a)		93032601	1-57.3
23(a)(2)		92051201	2-564.72
23(a)(2)		93032601	1-57.3
23(a)(4)		2038	1-50
23(a)(8)		4175	1-48
23(a)(9)		1705	1-51
23(b)(5)		1705	1-51
23(c)		1522	1-48
23(c)		D9309010	1-57.1
23(c)	STD	1-1.13	1-46
23(c)	STD	1-1.8	1-44
23(c)(1)		2003	1-53
23(c)(1)	STD	1-1.5	1-41
1910.23(c)(1)	STD	1-1.7	1-43
23(e)(1)		1282	1-55
23(e)(1)	STD	1-1.10	1-45
23(e)(3)(ii)	STD	1-1.1	1-40
23(e)(3)(v)		1182	1-54
23(e)(3)(v)		1282	1-55
23(e)(4)		2003	1-53
23(e)(4)		2071	1-37
23(e)(5)(iii)		1395	1-56
23(e)(5)(iii)	STD	1-1.6	1-42
23(e)(6)	STD	1-1.6	1-42
23(e)(8)		2038	1-50
24(e)		1245	1-57
25(a)		1445	3-485
26		1469	1-58
26(a)		1393	2-180
26(c)(3)(viii)		92091101	2-212.2
27		92111201	4-56.1
27	STD	1-1.12	1-62

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Standard Number	Record ID	Volume and Page No.
1910.27(a)	1183	1-64
27(a)	1393	2-180
27(a)	93032601	1-57.3
27(b)(1)	92100901	3-591.6
27(b)(1)	STD 1-1.9	1-60
27(b)(1)(ii)	1247	1-66
27(b)(1)(ii)	2059	1-68
27(b)(1)(iii)	1408	1-67
27(b)(2)	D9310037	1-71.2
27(c)(6)	D93040701	1-71.1
27(d)	1288	1-69
27(d)(2)	1288	1-69
27(d)(2)	1705	1-51
27(d)(2)	2089	1-70
27(d)(5)	2089	1-70
1910.27(d)(5)	4191	1-65
27(d)(5)	STD 1-1.3	1-59
28(a)	1636	1-86
28(a)(18)	2212	3-526
28(a)(26)	2468	1-82
28(a)(9)	1496	1-80
28(a)(9)	4063	1-81
28(g)	1554	1-76
28(g)(1)	2083	1-78
28(g)(9)	2468	1-82
28(i)(1)	3139	1-83
28(q)(5)	92102802	3-505.10
29(a)(1)	2215	1-94
29(a)(3)(vii)	1999	1-95
29(a)(4)(ii)	92062403	3-505.3
36(a)	STP 2-2.8B	1-97
36(b)(4)	1186	1-100
1910.36(b)(4)	1455	1-102
36(b)(8)	D9310004	1-102.1
36(b)(8)	STD 1-2.1	1-96
37(a)(3)	D9308015b	1-110.1.1
37(i)	1232	1-108
37(i)	1421	1-109
37(j)	2061	1-110
37(q)(1)	2212	3-526
37(q)(1)	2324	1-106
37(q)(6)	1186	1-100
37(q)(6)	D9308015b	1-110.1.1
38(Appendix to Subpart E)(1)	92121601	1-110.1.3
38(Appendix to Subpart E)(2)	92121601	1-110.1.3
38(a)	3841	1-349
38(a)	91110801	1-412.76
38(a)	92062401	1-110.1.1
38(a)	92092201	1-412.98
1910.38(a)(1)	4100	1-313
38(a)(1)	4180	1-343
38(a)(1)	4441	1-409
38(a)(2)	92050801	1-412.88
38(a)(2)	92121601	1-110.1.3
38(a)(2)(i)	92121601	1-110.1.3
38(a)(3)	1503	2-12

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Standard Number		Record ID	Volume and Page No.
1910.38(a)(3)(i)		1731	3-19
38(a)(3)(i)		1733	3-8
38(a)(3)(i)		92121601	1-110.1.3
38(a)(3)(ii)		1731	3-19
38(a)(3)(ii)		1733	3-8
38(a)(5)(i)		92121601	1-110.1.3
38(a)(5)(i)		D9306028a	2-159.4
38(b)		92062401	1-110.1.1
38(b)(4)(i)		1967	1-376
38(b)(4)(i)		4107	1-389
1910.38(b)(4)(i)		D9306028b	2-159.5
46		D9308019	4-62.1
66	STD	1-3.3CH-1	1-75
66	STP	2-1.156	1-111
66(Appendix C)(I)		2468	1-82
66(a)		92121501	1-115.2
66(b)(3)	STD	1-3.3	1-72
66(c)(1)		92121501	1-115.2
66(d)		92121501	1-115.2
66(e)(1)(i)		2468	1-82
66(e)(3)		1522	1-48
66(f)		1554	1-76
66(f)(3)(i)		4174	1-113
66(f)(3)(i)(C)		4174	1-113
66(f)(5)(i)(L)		92102801	1-115.1
66(f)(5)(i)(M)		92102801	1-115.1
66(g)		1522	1-48
1910.66(g)(2)		92121501	1-115.2
66(i)(2)(v)		2179	2-47
67(b)(1)		4083	1-120
67(b)(1)(v)		2069	1-116
67(b)(2)		2069	1-116
67(b)(4)		1188	1-121
67(b)(4)		1988	1-118
67(b)(4)		4083	1-120
67(c)(2)(ix)		92111001	2-58.3
67(c)(2)(ix)		93041501	2-58.6
68	STD	1-3.1	1-122
68(d)(1)		1189	1-123
94		1742	1-124
94(a)(1)(ii)		1237	1-127
94(a)(3)(i)(D)		1706	1-128
94(a)(5)(i)		2235	1-494
94(a)(5)(ii)		1614	1-435
1910.94(a)(5)(ii)(B)		2112	1-129
94(a)(5)(ii)(C)		1614	1-435
94(a)(5)(iii)		1237	1-127
94(a)(5)(iii)		1614	1-435
94(a)(5)(iii)		2235	1-494
94(a)(5)(iii)(B)		2112	1-129
94(a)(5)(v)(B)		2112	1-129
94(c)(1)(iii)		92072804	1-131.1
94(c)(6)(i)		1515	1-248
94(d)(10)		2023	1-131
94(d)(11)(iii)		2224	1-126
94(d)(9)(vi)		2224	1-126

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1910.95	1621	4-67
95	4128	1-19
95	STP 2-1.110	1-195.1
95(Appendix B)	2017	1-164
95(Appendix D)	2006	1-163
95(Appendix E)	2134	1-191
95(a)	1242	1-133
95(a)	1606	1-150
95(a)	1721	1-166
95(a)	1746	1-153
95(a)	1793	1-158
95(a)	3580	1-170
95(b)(1)	1693	1-151
95(b)(1)	1754	1-154
95(b)(1)	1770	1-155
95(b)(1)	2017	1-164
95(b)(1)	2058	1-165
95(b)(1)	2186	1-168
95(b)(1)	2210	1-169
95(b)(1)	3580	1-170
95(c)	1251	1-171
95(c)(1)	2036	1-183
1910.95(c)(1)	2196	1-173
95(d)	1249	1-135
95(d)	1251	1-171
95(d)	2036	1-183
95(d)(1)(ii)	1250	1-181
95(d)(2)(i)	1250	1-181
95(d)(2)(ii)	1779	1-156
95(d)(2)(ii)	1784	1-157
95(f)	3054	1-185
95(g)(10)	1283	1-4
95(g)(10)	1304	1-139
95(g)(10)	1453	1-172
95(g)(10)	1603	1-7
95(g)(10)	1743	1-152
95(g)(10)	2930	1-188
95(g)(10)	4126	1-7
95(g)(10)(i)	2137	1-187
1910.95(g)(10)(i)	4495	1-174
95(g)(10)(i)	4497	1-176
95(g)(10)(i)	4514	1-179
95(g)(10)(ii)	4497	1-176
95(g)(2)	1524	1-145
95(g)(3)	1306	1-140
95(g)(3)	1755	1-167
95(g)(3)	1793	1-158
95(g)(3)	1998	1-182
95(g)(5)	1236	1-132
95(g)(5)	1302	1-136
95(g)(6)	1302	1-136
95(g)(6)	1527	1-146
95(g)(7)	1310	1-141
95(g)(7)(i)	1881	1-160
95(g)(7)(ii)	1310	1-141
95(g)(7)(ii)	1560	1-147

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1910.95(g)(7)(ii)	4346	1-186
95(g)(7)(iii)	4495	1-174
95(g)(7)(ii)	93020801	1-195.2
95(g)(8)	1867	1-159
95(g)(8)(i)	1304	1-139
95(g)(8)(i)	1468	1-144
95(g)(8)(i)	1881	1-160
95(g)(8)(ii)	1453	1-172
95(g)(8)(ii)	1560	1-147
95(g)(9)	1881	1-160
95(g)(9)(2)	1468	1-144
95(g)(9)(i)	1791	1-190
95(g)(9)(i)	3101	1-189
95(g)(9)(ii)	3101	1-189
95(h)(2)	2006	1-163
95(h)(4)	2006	1-163
95(h)(5)	1609	2-584
1910.95(h)(5)	2134	1-191
95(h)(5)(i)	1303	1-138
95(h)(5)(i)	1323	1-143
95(h)(5)(iii)	2134	1-191
95(i)(1)	1452	1-194
95(i)(1)	1770	1-155
95(i)(2)	1536	1-192
95(i)(3)	1452	1-194
95(j)(1)	2017	1-164
95(j)(2)	1251	1-171
95(j)(2)	1536	1-192
95(k)	2018	1-195
95(m)(1)	1283	1-4
95(m)(1)	1311	1-142
95(m)(2)	1311	1-142
95(m)(2)(ii)(E)	1251	1-171
95(m)(3)(i)	1311	1-142
1910.95(m)(3)(ii)	1311	1-142
95(o)	1248	1-134
95(o)	1297	3-355
95(p)	1994	1-161
95(p)	4497	1-176
96	92100601	1-201.2
96	92102701	2-159.2
96	STP 2.8	1-201.1
96(a)	3761	1-199
96(a)	4253	1-197
96(b)	D9308040	4-18.3
96(b)(1)	2313	1-196
96(b)(2)	2313	1-196
96(c)	92070801	1-412.107
96(c)(1)	92100601	1-201.2
96(d)(1)	4253	1-197
96(e)(4)(i)	92100601	1-201.2
1910.96(p)(1)	1940	3-135
96(p)(1)	3761	1-199
96(p)(3)(i)	3761	1-199
97	1621	4-67
97	2257	1-202

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1910.97	PUB	8-1.7	1-204.1
97(a)(2)		92070801	1-412.107
97(a)(3)		4875	1-203
100		4343	1-533
101(a)		2422	1-205
101(b)		2422	1-205
101(c)		2422	1-205
104	STD	1-5.8	1-206
104(b)(3)(i)	STD	1-5.8	1-206
104(b)(3)(iii)	STD	1-5.8	1-206
104(b)(3)(xviii)	STD	1-5.8	1-206
106		2025	1-218
1910.106(a)		1385	1-217
106(a)(14)	STD	1-5.9	1-211
106(a)(17)		1431	3-458
106(a)(18)		1970	1-234
106(a)(18)(ii)(b)		1970	1-234
106(a)(18)(iii)		1970	1-234
106(b)(1)(i)(b)		1491	1-235
106(b)(2)(vii)	STD	1-5.2	1-208
106(b)(2)(vii)(c)	STD	1-5.4	1-209
106(b)(7)		2022	1-236
106(c)(1)(i)		2022	1-236
106(d)(1)(ii)		2103	1-233
106(d)(2)		1300	1-237
106(d)(2)		92120901	1-243.1
106(d)(2)(i)		1859	1-238
106(d)(2)(i)	STD	1-5.14A	1-213
106(d)(2)(ii)		1654	1-230
1910.106(d)(2)(iii)		1654	1-230
106(d)(3)(i)		1475	1-254
106(d)(5)		(6)001	1-239
106(d)(5)(i)		92120901	1-243.1
106(d)(5)(ii)		92120901	1-243.1
106(d)(5)(vi)		92120901	1-243.1
106(e)(2)	STD	1-5.7	1-210
106(e)(2)(ii)(b)	STD	1-5.15	1-215
106(e)(2)(ii)(c)		1296	1-229
106(e)(2)(iv)(d)		1521	1-242
106(e)(6)(ii)		1778	1-241
106(f)(3)(iii)		1521	1-242
106(h)(4)(i)		1654	1-230
106(h)(4)(i)(b)		1654	1-230
106(h)(4)(i)(d)		1654	1-230
106(h)(4)(iii)		1296	1-229
106(h)(4)(iii)(a)		1296	1-229
1910.106(h)(5)		1484	1-243
106(h)(7)(i)(B)		1778	1-241
106(h)(8)(iii)	STD	1-5.13	1-212
106(j)(2)	STD	1-5.4	1-209
107		2025	1-218
107(a)		92072804	1-131.1
107(b)(1)		2219	1-250
107(b)(2)		2219	1-250
107(b)(3)		2047	1-251
107(b)(5)(i)		1515	1-248

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1910.107(b)(5)(i)	STD	1-5.10	1-245
107(b)(5)(iv)	STD	1-5.11	1-246
107(c)(1)		92072804	1-131.1
107(d)(1)		92072804	1-131.1
107(d)(9)		1604	1-252
107(e)(2)		1475	1-254
107(f)(1)	STD	1-5.11	1-246
107(g)(3)	STD	1-5.13	1-247
107(h)(12)	STD	1-5.1	1-244
107(h)(7)		1261	2-94
107(n)		1290	1-255
107(n)		4184	1-248
107(n)		92072804	1-131.1
108		2025	1-218
108(a)(1)	STD	1-5.5	1-256
108(b)(1)		1334	1-260
108(c)(2)(i)		1222	1-261
108(c)(2)(i)		1334	1-260
108(c)(3)		1334	1-260
108(c)(3)	STD	1-5.6A	1-257
108(c)(5)		1970	1-234
108(c)(6)		1261	2-94
108(c)(7)		1191	1-262
108(e)(2)		1334	1-260
1910.108(f)(2)	STD	1-5.13	1-259
109	CPL	2-2.45A	1-276.1
109	STD	1-5.12	1-263
109(a)(1)		1660	1-267
109(a)(3)		93061401	1-276.6
109(b)(1)	STD	1-5.18	1-265
109(c)	STD	1-5.12	1-263
109(c)(1)		1704	1-268
109(c)(1)(ii)		1704	1-268
109(c)(1)(iv)		1704	1-268
109(c)(4)(iii)		1704	1-268
109(d)(1)(iv)	STD	1-5.18	1-265
109(e)(1)		1704	1-268
109(e)(1)(v)	STD	1-5.12	1-263
109(h)(1)		1660	1-267
109(h)(3)(iii)(e)		4114	1-269
109(i)(1)		1660	1-267
1910.110(b)(14)(iv)	STD	1-5.16	1-270
110(b)(6)(ii)		2051	1-272
110(b)(6)(ii)		4204	1-271
110(e)(4)(i)		1425	1-273
111(a)		3822	1-379
111(b)		2427	1-274
111(b)(7)(iv)		(7)001	1-275
111(e)		2427	1-274
119	CPL	2-2.45A	1-276.1
119(Appendix A)		92072803	1-276.2
119(a)		92062405	1-276.4
119(a)		93061401	1-276.6
119(a)(2)(ii)		92082601	1-276.5
119(a)(2)(iii)		92082601	1-276.5
119(b)		92062405	1-276.4

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1910.119(g)		92100902	1-276.3
119(h)(3)(i)		92100902	1-276.3
119(n)		92121601	1-110.1.3
120		93032401	1-412.113
120	CPL	2-2.53	1-572
120	STP	2-1.136A	1-412.56
120	STP	2-1.154C	1-412.53
120(Appendix B(Part B(I))		92091701	1-412.97
120(Appendix C)		92070801	1-412.107
120(Appendix C(2))		91100201	1-412.71
120(Appendix C(6))		91122401	1-412.79
120(a)		1826	1-280
120(a)		3797	1-374
120(a)		4106	1-344
120(a)		4159	1-335
120(a)		92021201	1-412.80
120(a)		93032401	1-412.113
120(a)(1)		1963	1-283
120(a)(1)		1965	1-361
120(a)(1)		3102	1-292
1910.120(a)(1)		3304	1-368
120(a)(1)		3315	1-298
120(a)(1)		3705	1-303
120(a)(1)		3797	1-374
120(a)(1)		3822	1-379
120(a)(1)		3845	1-304
120(a)(1)		4095	1-312
120(a)(1)		4100	1-313
120(a)(1)		4365	1-398
120(a)(1)		4394	1-323
120(a)(1)		4405	1-332
120(a)(1)		92081201	1-412.61
120(a)(1)	STP	2-1.154C	1-412.53
120(a)(1)(i)		1963	1-283
120(a)(1)(i)		3057	1-390
120(a)(1)(i)		4122	1-345
120(a)(1)(i)		4365	1-398
1910.120(a)(1)(i)		4413	1-403
120(a)(1)(i)		93061701	1-412.100
120(a)(1)(ii)		92042401	1-412.86
120(a)(1)(iii)		3779	1-348
120(a)(1)(iv)		3845	1-304
120(a)(1)(iv)		4400	1-328
120(a)(1)(v)		3822	1-379
120(a)(1)(v)		4400	1-328
120(a)(1)(v)		4412	1-402
120(a)(1)(v)		4441	1-409
120(a)(2)		92050801	1-412.88
120(a)(2)(i)		92042401	1-412.86
120(a)(2)(i)		92070801	1-412.107
120(a)(2)(i)		93032401	1-412.113
120(a)(2)(ii)		92090801	1-412.93
120(a)(2)(iii)		2940	1-287
120(a)(2)(iii)		4100	1-313
1910.120(a)(2)(iii)		4360	1-320
120(a)(2)(iii)(B)		92092201	1-412.98

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1910.120(a)(3)		3102	1-292
120(a)(3)		3204	1-393
120(a)(3)		3315	1-298
120(a)(3)		3841	1-349
120(a)(3)		3845	1-304
120(a)(3)		4122	1-345
120(a)(3)		4400	1-328
120(a)(3)		90111401	1-412.66
120(a)(3)		91110801	1-412.76
120(a)(3)		92062901	1-412.91
120(a)(3)		92031204	2-564.90
120(a)(3)		93041401	1-537.12
120(a)(3)		93080502	1-412.102
120(a)(3)		D93082301	1-412.58
120(a)(3)	STP	2-1.154C	1-412.53
1910.120(a)(3)(iii)		93080502	1-412.102
120(a)(3)(iv)		92062901	1-412.91
120(a)(i)		1966	1-285
120(a)(ii)		1966	1-285
120(a)(iii)		1966	1-285
120(b)(1)		92042401	1-412.86
120(b)(1)(i)		92081201	1-412.61
120(b)(1)(ii)(C)		D9308017	1-412.62
120(b)(4)		3102	1-292
120(b)(4)		D9308017	1-412.62
120(b)(4)(i)		1966	1-285
120(b)(4)(iv)		D93082301	1-412.58
120(c)		92042401	1-412.86
120(c)		93032401	1-412.113
120(c)(1)		92042401	1-412.86
120(c)(3)		3845	1-304
120(c)(3)		3853	1-364
1910.120(c)(3)		92021201	1-412.80
120(c)(3)		92021301	1-412.82
120(c)(5)(ii)		3200	1-360
120(c)(7)		3853	1-364
120(e)		92042401	1-412.86
120(e)		92120401	2-564.138
120(e)(1)		1965	1-361
120(e)(1)		3304	1-368
120(e)(1)		4067	1-334
120(e)(1)		4404	1-331
120(e)(1)		91081501	1-412.68
120(e)(1)		91101601	1-412.74
120(e)(1)		92020501	1-412.80
120(e)(1)		92081201	1-412.61
120(e)(1)		92091102	1-412.94
120(e)(1)(i)		1910	3-269
120(e)(1)(i)		3315	1-298
1910.120(e)(1)(i)		3541	3-16
120(e)(1)(i)		3550	1-301
120(e)(1)(i)		3705	1-303
120(e)(1)(i)		3822	1-379
120(e)(1)(i)		3841	1-349
120(e)(1)(ii)		3822	1-379
120(e)(1)(ii)		3853	1-364

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1910.120(e)(1)(ii)	4067	1-334
120(e)(1)(ii)	92051301	1-412.90
120(e)(1)(ii)	92090801	1-412.93
120(e)(2)	3317	1-300
120(e)(2)	91101601	1-412.74
120(e)(2)	92051301	1-412.90
120(e)(2)	93080502	1-412.102
120(e)(2)(vi)	3304	1-368
120(e)(3)	1889	1-366
120(e)(3)	2938	1-362
1910.120(e)(3)	3102	1-292
120(e)(3)	4159	1-335
120(e)(3)	92021201	1-412.80
120(e)(3)	92021301	1-412.82
120(e)(3)	92070801	1-412.107
120(e)(3)	92081201	1-412.61
120(e)(3)	92090801	1-412.93
120(e)(3)	92091102	1-412.94
120(e)(3)	93031201	1-412.110
120(e)(3)	93061701	1-412.100
120(e)(3)	92090801	1-412.93
120(e)(3)(ii)	1963	1-283
120(e)(3)(iii)	3550	1-301
120(e)(3)(iii)	3801	1-358
120(e)(3)(iii)	92042401	1-412.86
120(e)(3)(iii)	91101601	1-412.74
120(e)(4)	92051301	1-412.90
120(e)(4)	93031201	1-412.110
1910.120(e)(4)	3317	1-300
120(e)(5)	92020501	1-412.80
120(e)(5)	1852	1-281
120(e)(6)	4404	1-331
120(e)(6)	4404	1-331
120(e)(8)	4405	1-332
120(e)(8)	92030601	1-412.82
120(e)(8)	92051301	1-412.90
120(e)(8)	93031201	1-412.110
120(e)(8)	1852	1-281
120(e)(9)	4404	1-331
120(e)(9)	4405	1-332
120(e)(9)	91081501	1-412.68
120(e)(9)	91081901	1-412.70
120(e)(9)	92042401	1-412.86
120(e)(9)	93061701	1-412.100
120(e)(9)	3304	1-368
1910.120(f)(1)	92070801	1-412.107
120(f)(1)	1889	1-366
120(f)(2)	92070801	1-412.107
120(f)(2)	93080502	1-412.102
120(f)(2)	92070801	1-412.107
120(f)(2)	93080502	1-412.102
120(f)(2)(i)	92070801	1-412.107
120(f)(2)(ii)	92070801	1-412.107
120(f)(4)(i)	93032401	1-412.113
120(f)(7)(i)(A)	93032401	1-412.113
120(g)(1)	93032401	1-412.113
120(g)(1)(ii)		
120(g)(2)		

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1910.1120(g)(3)	93041401	1-537.12
120(g)(3)(iv)	92091701	1-412.97
120(g)(4)	93041401	1-537.12
120(g)(5)	4410	1-401
120(g)(5)	93041401	1-537.12
20(h)	92042401	1-412.86
120(h)(1)(i)	93032401	1-412.113
120(h)(2)	93032401	1-412.113
120(h)(3)	93032401	1-412.113
120(k)(1)	D93082301	1-412.58
120(k)(2)(ii)	4098	1-370
120(k)(2)(ii)	D93082301	1-412.58
120(k)(2)(iii)	D93082301	1-412.58
120(k)(3)	D93082301	1-412.58
120(k)(4)	4098	1-370
120(k)(8)	D93082301	1-412.58
120(l)(2)	92121601	1-110.1.3
120(n)(7)	D93082301	1-412.58
120(p)	3822	1-379
120(p)	4360	1-320
120(p)	4394	1-323
120(p)(2)	4124	1-373
1910.120(p)(2)	90111401	1-412.66
120(p)(2)	92050801	1-412.88
120(p)(5)	1857	1-282
120(p)(6)	1857	1-282
120(p)(6)	92040201	1-412.84
120(p)(7)	3797	1-374
120(p)(7)	3822	1-379
120(p)(7)	3841	1-349
120(p)(7)	4118	1-371
120(p)(7)(ii)	4353	1-316
120(p)(8)	2940	1-287
120(p)(8)	4100	1-313
120(p)(8)	92062401	1-110.1.1
120(p)(8)	92092201	1-412.98
120(p)(8)	93041401	1-537.12
120(p)(8)(i)	4360	1-320
120(p)(8)(i)	91110801	1-412.76
1910.120(p)(8)(i)	92092201	1-412.98
120(p)(8)(ii)	4360	1-320
120(p)(8)(ii)	92121601	1-110.1.3
120(p)(8)(iii)	4360	1-320
120(p)(8)(iii)	90111401	1-412.66
120(p)(8)(iii)	92062901	1-412.91
120(p)(8)(iii)(B)	90111501	1-412.64
120(q)	2982	1-289
120(q)	3102	1-292
120(q)	4360	1-320
120(q)	4400	1-328
120(q)	4412	1-402
120(q)	90111501	1-412.64
120(q)	92040201	1-412.84
120(q)	92050801	1-412.88
120(q)	92062401	1-110.1.1
120(q)	92062901	1-412.91

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Standard Number	Record ID	Volume and Page No.
1910.120(q)	92092201	1-412.98
120(q)	93041401	1-537.12
120(q)	93061701	1-412.100
120(q)	CPL 2-2.59	1-412.1
120(q)(1)	2940	1-287
120(q)(1)	4180	1-343
120(q)(1)	4360	1-320
120(q)(1)	4416	1-404
120(q)(1)	4441	1-409
120(q)(1)	92121601	1-110.1.3
120(q)(1)	93041401	1-537.12
120(q)(1)	4416	1-404
120(q)(10)	93041401	1-537.12
120(q)(10)	3102	1-292
120(q)(11)	3841	1-349
120(q)(11)	2982	1-289
120(q)(11)(i)	3057	1-390
120(q)(11)(i)	4107	1-389
1910.120(q)(11)(i)	4167	1-392
120(q)(11)(i)	CPL 2-2.51	1-277
120(q)(11)(i)	1967	1-376
120(q)(11)(ii)	3057	1-390
120(q)(11)(ii)	4107	1-389
120(q)(11)(ii)	4167	1-392
120(q)(11)(ii)	93080502	1-412.102
120(q)(11)(ii)	4355	1-317
120(q)(2)	92050801	1-412.88
120(q)(2)	92121601	1-110.1.3
120(q)(2)	92121601	1-110.1.3
120(q)(2)(i)	4360	1-320
120(q)(2)(ii)	92121601	1-110.1.3
120(q)(2)(iv)	4180	1-343
120(q)(2)(vi)	4400	1-328
120(q)(2)(vi)	4416	1-404
120(q)(2)(xi)	3845	1-304
1910.120(q)(3)	4400	1-328
120(q)(3)	92050801	1-412.88
120(q)(3)	3102	1-292
120(q)(3)(i)	4360	1-320
120(q)(3)(i)	4400	1-328
120(q)(3)(i)	4159	1-335
120(q)(3)(ii)	91071001	2-10.1
120(q)(3)(iii)	91110801	1-412.76
120(q)(3)(iii)	3204	1-393
120(q)(3)(vi)	2982	1-289
120(q)(4)	3822	1-379
120(q)(4)	3841	1-349
120(q)(4)	4400	1-328
120(q)(4)	3822	1-379
120(q)(5)	3841	1-349
120(q)(5)	1826	1-280
120(q)(6)	4067	1-334
1910.120(q)(6)	4355	1-317
120(q)(6)	4360	1-320
120(q)(6)	4394	1-323
120(q)(6)	4400	1-328
120(q)(6)		

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Standard Number		Record ID	Volume and Page No.
1910.120(q)(6)		4416	1-404
120(q)(6)		4419	1-407
120(q)(6)		4441	1-409
120(q)(6)		90111401	1-412.66
120(q)(6)		92050801	1-412.88
120(q)(6)		92081204	2-564.90
120(q)(6)		92092201	1-412.98
120(q)(6)		92121601	1-110.1.3
120(q)(6)		93061701	1-412.100
120(q)(6)		D9308041	1-412.63
120(q)(6)(i)		3317	1-300
120(q)(6)(i)		3703	1-395
1910.120(q)(6)(i)		3822	1-379
120(q)(6)(i)		3841	1-349
120(q)(6)(i)		4360	1-320
120(q)(6)(i)		4410	1-401
120(q)(6)(i)		4416	1-404
120(q)(6)(i)		92040201	1-412.84
120(q)(6)(i)		92081204	2-564.90
120(q)(6)(i)		92092201	1-412.98
120(q)(6)(ii)		2931	1-286
120(q)(6)(ii)		3703	1-395
120(q)(6)(ii)		3822	1-379
120(q)(6)(ii)		3841	1-349
120(q)(6)(ii)		4360	1-320
120(q)(6)(ii)		4416	1-404
120(q)(6)(ii)		91100201	1-412.71
120(q)(6)(ii)		91122401	1-412.79
120(q)(6)(ii)		92040201	1-412.84
1910.120(q)(6)(iii)		3796	1-397
120(q)(6)(iii)		3822	1-379
120(q)(6)(iii)		3841	1-349
120(q)(6)(iii)		4360	1-320
120(q)(6)(iii)		91100201	1-412.71
120(q)(6)(iv)		3822	1-379
120(q)(6)(iv)		3841	1-349
120(q)(6)(iv)		4360	1-320
120(q)(6)(iv)		91100201	1-412.71
120(q)(6)(v)		3796	1-397
120(q)(6)(v)		4360	1-320
120(q)(7)		4360	1-320
120(q)(8)		92091102	1-412.94
120(q)(9)		1889	1-366
120(q)(9)		4159	1-335
120(q)(9)		91101601	1-412.74
120(q)(9)		93080502	1-412.102
1910.120(q)(9)(i)		4159	1-335
132	STD	1-4.2	2-233
132(a)		1334	1-260
132(a)		1462	1-538
132(a)		1467	3-445
132(a)		1525	1-415
132(a)		1688	4-1
132(a)		1691	4-2
132(a)		1979	1-418
132(a)		2065	1-424

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Standard Number		Record ID	Volume and Page No.
1910.132(a)		2072	1-425
132(a)		2091	1-426
132(a)		2216	1-420
132(a)		2338	2-150
132(a)		2501	2-322
132(a)		3006	2-90
132(a)		3859	4-52
132(a)		4239	1-423
132(a)		92060201	1-426.2
132(a)		D9308035	1-426.1
132(a)	STD	1-1.13	1-413
132(c)		2338	2-150
132(c)		91071001	2-10.1
133	STD	1-4.2	2-233
133(a)(1)		1334	1-260
133(a)(1)		1985	1-597
133(a)(3)		1264	1-427
134		93030402	1-537.9
134		93030403	1-537.15
134		D9308037	1-537.3
134	CPL	2-2.54	1-537.1
134(a)		2008	1-476
134(a)		2224	1-126
1910.134(a)		92072804	1-131.1
134(a)(1)		1739	1-449
134(a)(1)		2037	1-460
134(a)(1)		2188	1-461
134(a)(1)		3625	2-325
134(a)(1)		92030502	1-537.5
134(a)(1)		93030401	1-537.7
134(a)(1)		93030402	1-537.9
134(a)(1)		93030403	1-537.15
134(a)(11)		1601	1-434
134(a)(2)		1618	1-438
134(a)(2)		1698	1-447
134(a)(2)		3360	1-471
134(b)		1239	1-477
134(b)		93030401	1-537.7
134(b)		93030402	1-537.9
134(b)		93030403	1-537.15
1910.134(b)(1)		D9310053	3-444.6
134(b)(10)		1788	1-478
134(b)(10)		2118	1-480
134(b)(10)		4496	1-536
134(b)(10)		92070801	1-412.107
134(b)(10)		D9310053	3-444.6
134(b)(11)		1615	1-437
134(b)(11)		1618	1-438
134(b)(11)		1630	1-441
134(b)(11)		1741	1-451
134(b)(11)		1756	1-454
134(b)(11)		2235	1-494
134(b)(11)		2488	1-465
134(b)(11)		93030401	1-537.7
134(b)(11)		93030402	1-537.9
134(b)(11)		93030403	1-537.15

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Standard Number	Record ID	Volume and Page No.
1910.134(b)(11)	D9310053	3-444.6
134(b)(3)	92030502	1-537.5
134(b)(3)	D9310053	3-444.6
134(b)(5)	D9310053	3-444.6
134(b)(6)	D9310053	3-444.6
134(b)(8)	2987	1-469
134(b)(8)	4343	1-533
134(b)(8)	93041401	1-537.12
134(c)	1442	3-446
134(c)	1515	1-248
134(c)	1615	1-437
134(c)	1629	1-440
134(c)	1741	1-451
134(c)	1967	1-376
134(c)	2233	1-463
134(c)	2316	1-493
134(c)	2498	1-467
134(c)	2510	1-490
1910.134(c)	2987	1-469
134(c)	3538	1-473
134(c)	3701	3-361
134(c)	3727	1-481
134(c)	93030402	1-537.9
134(c)	93030403	1-537.15
134(c)	D9308037	1-537.3
134(d)	1477	1-484
134(d)	2224	1-126
134(d)	D9311012	1-537.4
134(d)(2)	1253	1-485
134(d)(2)(i)	D9311012	1-537.4
134(d)(2)(ii)	1792	1-456
134(d)(2)(ii)	2225	1-486
134(d)(2)(ii)	2226	1-487
134(d)(2)(ii)	2510	1-490
134(d)(3)	1797	1-489
1910.134(d)(4)	1792	1-456
134(e)	1498	1-431
134(e)	1630	1-441
134(e)(2)	1614	1-435
134(e)(2)	1629	1-440
134(e)(2)	1633	1-443
134(e)(2)	1651	1-445
134(e)(2)	1739	1-449
134(e)(2)	1756	1-454
134(e)(2)	1868	1-459
134(e)(2)	2233	1-463
134(e)(2)	2235	1-494
134(e)(2)	2310	1-464
134(e)(2)	2316	1-493
134(e)(2)	2498	1-467
134(e)(2)	2510	1-490
134(e)(2)	2987	1-469
1910.134(e)(2)	3538	1-473
134(e)(2)	3701	3-361
134(e)(2)	3727	1-481
134(e)(2)	4343	1-533

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Standard Number	Record ID	Volume and Page No.
1910.134(e)(3)	4416	1-404
134(e)(3)	93041401	1-537.12
134(e)(3)(i)	1442	3-446
134(e)(3)(i)	3353	1-500
134(e)(3)(i)	93041401	1-537.12
134(e)(3)(ii)	1843	1-495
134(e)(3)(ii)	2008	1-476
134(e)(3)(ii)	3538	1-473
134(e)(3)(ii)	93041401	1-537.12
134(e)(3)(iii)	2230	1-462
134(e)(5)	1202	1-502
134(e)(5)	1203	1-503
134(e)(5)	1204	1-504
1910.134(e)(5)	1753	1-512
134(e)(5)	1828	3-374
134(e)(5)	1829	1-513
134(e)(5)	1865	3-377
134(e)(5)	3923	3-394
134(e)(5)	4068	3-429
134(e)(5)	4077	1-532
134(e)(5)	4190	1-430
134(e)(5)	4394	1-323
134(e)(5)	4416	1-404
134(e)(5)	93030401	1-537.7
134(e)(5)	93030402	1-537.9
134(e)(5)	93030403	1-537.15
134(e)(5)	CPL 2-2.29	1-428
134(e)(5)(i)	1252	1-505
134(e)(5)(i)	1325	1-506
134(e)(5)(i)	1534	1-507
1910.134(e)(5)(i)	1618	1-438
134(e)(5)(i)	1692	1-509
134(e)(5)(i)	1744	1-510
134(e)(5)(i)	1752	1-453
134(e)(5)(i)	1799	1-458
134(e)(5)(i)	1967	1-376
134(e)(5)(i)	1977	1-519
134(e)(5)(i)	1983	1-521
134(e)(5)(i)	2032	1-523
134(e)(5)(i)	2204	1-524
134(e)(5)(i)	2227	1-526
134(e)(5)(i)	2235	1-494
134(e)(5)(i)	2507	2-326
134(e)(5)(i)	3050	1-528
134(e)(5)(i)	3390	1-529
134(e)(5)(i)	4107	1-389
134(e)(5)(i)	92030502	1-537.5
1910.134(e)(5)(i)	92102001	1-537.6
134(e)(5)(i)	93030401	1-537.7
134(e)(5)(i)	93030402	1-537.9
134(e)(5)(i)	93030403	1-537.15
134(e)(5)(i)	D9308037	1-537.3
134(e)(5)(ii)	1628	1-439
134(e)(5)(ii)	4173	1-474
134(f)(1)(ii)	1598	1-433
134(f)(2)(ii)	1786	1-455

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Standard Number		Record ID	Volume and Page No.
1910.134(f)(2)(ii)		1786	1-455
134(f)(2)(ii)		2488	1-465
134(g)(5)		2224	1-126
134(g)(6)		1615	1-437
134(h)(6)		2987	1-469
135		1467	3-445
136		1462	1-538
136		2065	1-424
136		2091	1-426
137		4243	3-525
141(a)(1)		1989	1-539
141(a)(4)		1688	4-1
141(a)(4)		1691	4-2
141(a)(4)		3859	4-52
141(a)(4)(i)		(5)015	2-564
141(b)(1)(i)		1989	1-539
141(c)		1458	1-540
141(c)(1)		1458	1-540
141(c)(1)(i)		1989	1-539
141(c)(2)		1458	1-540
141(d)(3)		D93082301	1-412.58
142		1823	1-542
142	CPL	2-2.53	1-572
142(a)		1212	1-541
142(c)(2)		1823	1-542
1910.142(f)(3)		1823	1-542
144(a)		2238	2-89
145(Appendix A)		3045	1-544
145(c)(2)		2238	2-89
145(c)(2)		D9309032	1-542.3
145(c)(3)		1522	1-48
145(c)(3)		2468	1-82
145(d)(10)	STD	1-7.2	1-543
145(f)	STP	2-1.130	1-545.1
145(f)(1)(i)		D9309032	1-542.3
145(f)(3)		3045	1-544
145(f)(3)		D9309032	1-542.3
145(f)(8)(i)		(5)015	2-564
145(f)(8)(i)		1688	4-1
145(f)(8)(i)		1691	4-2
145(f)(8)(i)		3045	1-544
145(f)(8)(i)		3859	4-52
1910.145(f)(8)(i)		4096	3-46
146		D9308008	1-545.7
146		D9308010	1-21.1
146	STP	2-1.170A	1-545.3
146(Appendix E)		D9309026	1-545.5
146(a)		D9308006	2-181.1
146(a)		D9308008	1-545.7
146(b)		92061501	3-340.1
146(b)		D9308008	1-545.7
146(b)		D9309026	1-545.5
146(c)		D9308006	2-181.1
146(c)(1)		D9308009	1-545.9
146(d)(5)		D9309026	1-545.5
146(d)(5)(i)		D9309026	1-545.5

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Standard Number		Record ID	Volume and Page No.
1910.146(e)(6)		D9309026	1-545.5
147	STD	1-7.3	1-546
147	STP	2-1.158A	1-562
147(a)		1197	2-100
147(a)(1)		D930227d	1-570.3
147(a)(1)		D930227e	1-570.4
147(a)(1)(ii)(A)		D930227c	1-570.2
147(a)(1)(ii)(A)		D930227f	1-570.5
147(a)(2)		D9310055	2-196.1
147(a)(2)(i)		1671	2-82
147(a)(2)(i)		4574	1-566
147(a)(2)(ii)		4574	1-566
147(a)(2)(iii)(A)		D9310038	1-570.8
147(a)(3)(i)		92062404	1-570.11
147(b)		4574	1-566
147(c)(1)		92062404	1-570.11
147(c)(1)		D9310052	1-570.9
147(c)(2)(i)		92062404	1-570.11
147(c)(2)(i)		D9309032	1-542.3
147(c)(2)(ii)		92062404	1-570.11
1910.147(c)(2)(iii)		92062404	1-570.11
147(c)(3)		D9310035	1-570.6
147(c)(3)(i)		D930227e	1-570.4
147(c)(4)		D93031501	2-200.2
147(c)(4)(i)		4189	1-564
147(c)(4)(i)		D930227d	1-570.3
147(c)(5)(ii)		D930227e	1-570.4
147(c)(5)(ii)(A)(1)		D930227e	1-570.4
147(c)(5)(ii)(A)(2)		D930227e	1-570.4
147(c)(5)(ii)(B)		4411	2-210
147(c)(5)(ii)(B)(2)		D930227e	1-570.4
147(c)(5)(ii)(C)(2)		D930227e	1-570.4
147(c)(5)(ii)(D)		4207	1-565
147(c)(6)(i)		D93010301	1-570.1
147(e)(3)		D9310052	1-570.9
147(f)(2)		D930227f	1-570.5
147(f)(2)(i)		D930227c	1-570.2
1910.147(f)(2)(i)		D930227f	1-570.5
147(f)(2)(ii)		D930227c	1-570.2
147(f)(2)(ii)		D930227f	1-570.5
147(f)(3)		D9310052	1-570.9
147(f)(3)(ii)(C)		D9310052	1-570.9
147(f)(3)(ii)(D)		D9310052	1-570.9
151		3204	1-393
151	CPL	2-2.53	1-572
151	CPL	2.2	1-571
151(a)		1666	2-35
151(a)		4418	1-589
151(a)		93033001	1-597.5
151(b)		1869	1-591
151(b)		1873	1-592
151(b)		3598	1-593
151(b)		3736	1-583
151(b)		4418	1-589
1910.151(b)		92100501	1-597.3
151(b)		93033001	1-597.5

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Standard Number		Record ID	Volume and Page No.
1910.151(c)		1384	1-594
151(c)		1985	1-597
151(c)		2088	1-596
151(c)		93033001	1-597.5
151(c)		D93082301	1-412.58
151(c)		D9310039	1-597.1
151(c)	STD	1-8.2	1-580
155(a)(41)		4420	2-1
155(c)(26)		3697	2-6
156(a)(1)		2322	2-4
156(a)(1)		3697	2-6
156(a)(2)		3697	2-6
156(b)(1)		3697	2-6
156(b)(2)		3697	2-6
156(c)(1)		3697	2-6
1910.156(c)(3)		2322	2-4
156(c)(4)		3697	2-6
156(e)(1)		3697	2-6
156(e)(1)		4082	2-9
156(e)(1)(i)		1996	2-8
156(e)(3)		91071001	2-10.1
156(e)(3)(ii)	STD	1-9.3	2-2
156(f)(1)(ii)		3697	2-6
157(a)		1422	3-522
157(a)		1503	2-12
157(a)		4180	1-343
157(a)		93051501	3-277.10
157(b)(1)		1503	2-12
157(b)(1)		4180	1-343
157(d)(1)		1381	2-15
157(f)(2)	STD	1-9.2	2-10
157(f)(4)	STD	1-9.2	2-10
1910.157(g)		92062401	1-110.1.1
157(g)(1)		1503	2-12
157(g)(3)		D9306028b	2-159.5
157(g)(4)		D9306028b	2-159.5
158(a)		1423	2-16
165(b)(1)		1731	3-19
165(b)(1)		1733	3-8
165(b)(1)		92121601	1-110.1.3
165(b)(3)		1731	3-19
165(b)(3)		92121601	1-110.1.3
165(b)(4)		92121601	1-110.1.3
165(b)(5)		1733	3-8
165(d)(3)		92121601	1-110.1.3
169(b)(2)	STD	1-10.2	2-17
176(f)		1429	2-19
177	STP	2-1.114	2-20
177(a)(1)		1802	2-21
1910.177(a)(1)		4186	2-22
177(a)(2)		2080	2-23
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177(d)		1271	2-25
178(a)(2)	STD	1-11.1	2-26
178(a)(4)		1862	2-37

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1910.178(a)(4)		2176	2-38
178(c)(2)		4076	2-36
178(c)(2)	STD	1-11.6A	2-31
178(c)(2)(iii)		2109	2-40
178(c)(2)(iv)		2109	2-40
178(d)		1487	2-41
178(e)(1)		1404	2-42
178(e)(1)		2127	2-43
178(e)(2)		2127	2-43
178(g)(1)		1666	2-35
178(g)(2)		1666	2-35
178(g)(2)	STD	1-11.4	2-28
178(k)(1)	STD	1-11.5	2-29
178(k)(1)	STD	1-11.7	2-33
178(k)(3)		4125	2-44
178(m)(12)		1992	2-45
178(m)(6)	STD	1-11.3	2-27
178(m)(7)	STD	1-11.5	2-29
178(m)(7)	STD	1-11.7	2-33
179(a)		4176	2-49
179(a)(42)		4176	2-49
179(b)		1299	2-51
179(b)(1)		1713	2-46
179(b)(1)		2108	4-13
179(b)(2)		1377	2-52
179(b)(2)		1713	2-46
179(b)(2)		2000	2-53
1910.179(b)(2)		4176	2-49
179(b)(2)		D9309015	2-56.2
179(b)(4)		2179	2-47
179(b)(5)		D9309015	2-56.2
179(c)(3)		4176	2-49
179(d)(1)(ii)		4176	2-49
179(e)(4)		D93031801	2-56.1
179(e)(6)(i)	STD	3-12.4	3-517
179(g)(1)(iii)		4176	2-49
179(g)(2)(i)	STD	3-12.4	3-517
179(h)(2)(v)		2083	1-78
179(k)(2)		1818	2-54
179(k)(2)		2000	2-53
179(k)(2)		4176	2-49
179(k)(2)		D9309015	2-56.2
179(l)(2)(e)		1483	2-55
179(n)(1)		D9308033	3-531.3
1910.180(b)(1)		1533	2-57
180(c)(2)		91110501	2-58.2
180(g)(1)		D93072101	2-58.1
180(h)(3)(v)		2060	2-58
180(h)(3)(v)		92111001	2-58.3
180(h)(3)(v)		93041501	2-58.6
180(i)(5)(i)		1422	3-522
180(j)		2321	3-523
181(a)(29)		D9308011	2-58.9
181(j)(1)(i)	STD	3-12.4	3-517
184(c)(4)		1661	2-59
184(d)		1661	2-59

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1910.184(e)		1392	2-65
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184(e)(4)		1661	2-59
184(g)(5)		1661	2-59
184(i)(8)(ii)		1661	2-59
212	STD	1-12.27	2-127
212(a)		1376	2-96
212(a)	STD	1-12.28	2-79
212(a)(1)		1261	2-94
212(a)(1)		1671	2-82
212(a)(1)		1714	2-83
212(a)(1)		2238	2-89
212(a)(1)		2244	2-87
212(a)(1)		2457	2-146
212(a)(1)		4205	2-93
212(a)(1)		93041502	2-101.3
212(a)(1)		D93030101	2-101.2
212(a)(1)	STD	1-12.10	2-70
212(a)(1)	STD	1-12.19	2-72
212(a)(1)	STD	1-12.23	2-76
212(a)(1)	STD	1-12.28CH-1	2-81
212(a)(2)		1292	2-97
1910.212(a)(2)		1371	2-99
212(a)(2)		1795	2-84
212(a)(2)		2136	2-86
212(a)(2)		93041502	2-101.3
212(a)(2)		D93030101	2-101.2
212(a)(2)		D93080601	2-101.1
212(a)(2)	STD	1-12.28CH-1	2-81
212(a)(3)		93041502	2-101.3
212(a)(3)(ii)		1292	2-97
212(a)(3)(ii)		1371	2-99
212(a)(3)(ii)		1795	2-84
212(a)(3)(ii)		3006	2-90
212(a)(3)(ii)		D93030101	2-101.2
212(a)(3)(ii)	STD	1-12.12	2-71
212(a)(3)(ii)	STD	1-12.22	2-74
212(a)(3)(ii)	STD	1-12.25	2-78
212(a)(3)(ii)	STD	1-12.5	2-67
1910.212(a)(3)(ii)	STD	1-12.7	2-68
212(a)(3)(ii)	STD	1-12.9	2-69
212(a)(4)		1197	2-100
212(a)(4)		93041502	2-101.3
212(a)(5)		1456	2-101
212(a)(5)	STD	1-12.1	2-66
212(a)(a)(2)		2136	2-86
213(a)(4)	STD	1-12.15	2-103
213(b)(3)		1715	2-106
213(c)(1)		4103	2-108
213(c)(1)	STD	1-12.18	2-105
213(c)(2)		4103	2-108
213(c)(3)		4103	2-108
213(g)(1)	STD	1-12.18	2-105
213(h)(1)		1187	2-109
213(h)(1)		2052	2-110
213(h)(1)		3127	2-111

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1910.213(h)(1)	STD	1-12.17	2-104
213(h)(1)	STD	1-12.18	2-105
213(h)(2)		1187	2-109
213(h)(4)		4214	2-107
213(h)(5)	STD	1-12.4	2-102
215(a)(4)		2095	2-116
215(a)(4)	STD	1-12.8	2-113
215(b)(3)		2095	2-116
215(b)(5)		2095	2-116
215(b)(5)	STD	1-12.13	2-114
215(b)(5)	STD	1-12.26	2-115
215(d)(3)		1379	2-117
217	STD	1-12.21	2-120
217	STD	1-12.27	2-127
217(a)(5)	STD	1-12.7	2-118
217(b)	STD	1-12.21	2-120
217(b)(1)		1373	2-134
1910.217(b)(3)(i)	STD	1-12.20	2-119
217(b)(3)(ii)		1190	2-135
217(b)(4)(iii)		1190	2-135
217(b)(8)(iii)		1715	2-106
217(c)	STD	1-12.21	2-120
217(c)(2)(i)		1492	2-136
217(c)(2)(i)		4183	2-132
217(c)(3)(i)(e)		92122102	2-139.1
217(c)(3)(iii)(e)		4183	2-132
217(c)(3)(vii)		1225	2-137
217(c)(3)(vii)		92122102	2-139.1
217(c)(5)		2267	2-138
217(d)	STD	1-12.24	2-125
217(e)(1)(i)		1375	2-133
217(h)(11)(i)	STP	2-1.146A	2-129
218	STD	1-12.6	2-140
218(a)(3)(viii)		2053	2-141
1910.218(e)		1378	2-142
218(e)(1)(i)		1378	2-142
218(j)(3)		1261	2-94
219(a)(1)		1714	2-83
219(a)(1)		2238	2-89
219(a)(1)		2244	2-87
219(a)(1)	STD	1-12.19	2-144
219(b)(1)		1315	2-148
219(b)(1)		1373	2-134
219(b)(1)(vi)		1315	2-148
219(e)		2457	2-146
219(e)(1)(i)		2457	2-146
219(e)(1)(i)	STD	1-12.14	2-143
242(b)		2338	2-150
242(b)	STD	1-13.1	2-149
243(a)(3)	STD	1-13.4	2-153
243(c)(2)(ii)		1712	2-156
1910.243(d)(4)(iv)	STD	1-13.2A	2-152
243(e)(1)(i)	STP	2-1.118	2-154
243(e)(3)(vii)	STP	2-1.118	2-154
243(e)(4)(vi)	STP	2-1.118	2-154
252		92102701	2-159.2

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1910.252	STD	1-14.1	2-157
252(a)		92072804	1-131.1
252(a)(2)(iii)		D9306028a	2-159.4
252(a)(2)(iii)		D9306028b	2-159.5
252(a)(2)(iii)		D93062801	2-159.1
252(a)(2)(xiv)		1701	3-350
252(b)(2)		1264	1-427
252(b)(2)		1732	2-159
252(c)(11)(i)		1803	2-158
252(c)(11)(i)		1803	2-158
253(b)(5)(ii)		1892	2-164
253(b)(5)(ii)(C)		1875	2-160
253(b)(5)(ii)(D)		1875	2-160
254(c)(2)(i)		93040201	3-468.1
254(d)(3)		93040201	3-468.1
262(c)(1)		1428	2-165
263(a)(1)		1855	2-166
263(d)(7)		1261	2-94
263(i)(6)(ii)		2009	2-168
263(i)(7)		1261	2-94
263(l)(9)(i)		1849	2-171
263(l)(9)(ii)		1846	2-169
263(l)(9)(ii)		1849	2-171
265(c)(18)(i)		1261	2-94
265(d)(1)(ii)(b)	STD	1-15.2	2-175
266(c)(1)(vi)		1248	1-134
266(d)(2)(v)	STD	1-15.5	3-538
268(a)(2)(i)	STD	1-15.1	2-177
268(a)(3)		D9308006	2-181.1
1910.268(b)(7)		4083	1-120
268(f)(5)		2077	2-179
268(h)(8)		1393	2-180
268(h)(8)	STD	1-15.4	2-178
268(n)(1)(i)		2016	2-181
268(n)(11)(iv)		2016	2-181
268(o)(2)(i)(A)		D9308006	2-181.1
268(o)(2)(ii)(A)		D9308006	2-181.1
272(b)		1819	2-184
272(c)		1819	2-184
272(c)(2)		1762	2-182
272(i)(1)		1762	2-182
272(i)(2)(ii)		1762	2-182
272(i)(2)(ii)		3721	2-186
272(o)(1)(i)		4220	2-185
272(o)(1)(ii)		4220	2-185
301	STP	2.19	2-200.1
1910.302	STP	2.19	2-200.1
302(a)(2)(v)		4411	2-210
302(b)(2)		D9401019	2-200.5
303	STP	2.19	2-200.1
303(a)		1359	2-194
303(a)		1847	2-213
303(b)(1)		1621	4-67
303(b)(2)		1658	2-192
303(g)(1)(i)		D9310055	2-196.1
304	STP	2.19	2-200.1

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1910.304(e)(1)(iv)		D93031501	2-200.2
304(f)		1460	2-197
304(f)(1)(v)		D9309014	2-200.1.2
304(f)(5)(v)(c)(3)		D9401019	2-200.5
304(f)(5)(v)(c)(5)		D9401019	2-200.5
304(f)(5)(v)(c)(7)		D9401019	2-200.5
305	STP	2.19	2-200.1
305(a)(2)(iii)		92030301	2-200.7
305(b)(1)		D9308028	2-200.4
305(g)(1)(iii)(A)		93061101	2-200.3
305(j)(2)		D9401019	2-200.5
305(j)(2)(ii)		D9401019	2-200.5
305(j)(4)		4574	1-566
305(j)(4)(i)		4574	1-566
305(j)(4)(ii)(C)(1)		4574	1-566
305(j)(4)(ii)(D)		4574	1-566
305(j)(4)(ii)(E)		4574	1-566
305(j)(6)		D9310038	1-570.8
305(j)(7)		1460	2-197
306	STP	2.19	2-200.1
307	STP	2.19	2-200.1
307(Subpart S)	STD	1-16.6A	2-201
308	STP	2.19	2-200.1
331	STD	1-16.7	2-203
1910.331	STP	2-1.160	1-16
331	STP	2.19	2-200.1
331(a)		3749	3-210
331(a)(1)		3749	3-210
331(b)		92091101	2-212.2
331(c)(1)		4411	2-210
332		3749	3-210
332	STD	1-16.7	2-203
332	STP	2-1.160	1-16
332	STP	2.19	2-200.1
332(a)		3707	2-212
333	STD	1-16.7	2-203
333	STP	2.19	2-200.1
333(a)		3707	2-212
333(a)		D930227d	1-570.3
333(a)		D930227e	1-570.4
333(a)(1)		D9310055	2-196.1
1910.333(a)(2)		D930227g	2-212.1
333(a)(2)		D9310035	1-570.6
333(a)(2)		D9310055	2-196.1
333(b)(2)		D930227d	1-570.3
333(b)(2)(i)		D930227d	1-570.3
333(b)(2)(ii)(C)		D9310038	1-570.8
333(b)(2)(v)		4411	2-210
333(b)(2)(v)(C)(1)		4411	2-210
333(b)(2)(v)(C)(1)		D9309032	1-542.3
333(c)(2)		D930227g	2-212.1
333(c)(3)		1188	1-121
333(c)(3)		1988	1-118
333(c)(3)		4083	1-120
333(c)(3)(iii)		92091101	2-212.2
333(c)(7)		92091101	2-212.2

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1910.334		3707	2-212
334	STD	1-16.7	2-203
335		3707	2-212
335	STD	1-16.7	2-203
335	STP	2.19	2-200.1
335(a)(1)(i)		D930227g	2-212.1
399		1359	2-194
399		1847	2-213
399		2248	2-215
399		4574	1-566
399		93061101	2-200.3
399		D9310035	1-570.6
399	STP	2.19	2-200.1
410	CPL	2-2.53	1-572
422(e)		92070601	2-232.1
423(d)		92070601	2-232.1
1000		(3)328	3-102
1000		1277	2-273
1000		1435	2-275
1910.1000		1499	2-276
1000		1515	1-248
1000		1516	2-277
1000		1562	2-278
1000		1580	3-106
1000		1617	2-279
1000		1633	1-443
1000		1681	2-281
1000		1716	4-17
1000		1727	3-110
1000		1739	1-449
1000		1741	1-451
1000		1803	2-158
1000		1843	1-495
1000		1848	2-282
1000		1860	3-115
1000		1899	3-121
1910.1000		1902	3-123
1000		1904	3-124
1000		1905	3-205
1000		1923	3-126
1000		1925	3-128
1000		1935	3-133
1000		1942	3-196
1000		1956	3-141
1000		2066	2-283
1000		2104	2-284
1000		2122	2-285
1000		2133	2-295
1000		2164	3-147
1000		2180	2-296
1000		2185	2-298
1000		2218	2-300
1000		2225	1-486
1910.1000		2233	1-463
1000		2250	2-301
1000		2255	2-303

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1910.1000		2307	2-319
1000		2310	1-464
1000		2398	3-166
1000		2420	3-169
1000		2498	1-467
1000		2500	2-304
1000		2501	2-322
1000		2506	4-18
1000		2510	1-490
1000		2987	1-469
1000		3002	3-172
1000		3060	2-307
1000		3094	2-309
1000		3205	3-356
1910.1000		3299	2-311
1000		3316	3-178
1000		3390	1-529
1000		3625	2-325
1000		3727	1-481
1000		3845	1-304
1000		4078	3-192
1000		4116	3-232
1000		4185	3-185
1000		4206	2-329
1000		4215	2-313
1000		4229	2-585
1000		4368	3-103
1000		91100201	1-412.71
1000		92020601	3-277.6
1000		92072804	1-131.1
1000		92080502	2-330.1
1910.1000		92102701	2-159.2
1000		93040101	2-330.2
1000	CPL	2-2.26A	2-255
1000	CPL	2-2.7	2-234
1000	PUB	8-1.2A	2-377
1000	PUB	8-1.4A	2-256
1000	STD	1-4.2	2-233
1000(a)		2250	2-301
1000(a)		93032401	1-412.113
1000(a)(1)		2122	2-285
1000(a)(2)		91100201	1-412.71
1000(a)(3)		2977	2-305
1000(a)(4)		2250	2-301
1000(a)(5)(i)		92080502	2-330.1
1000(b)		93041401	1-537.12
1000(b)(1)		1360	2-274
1000(b)(2)		1360	2-274
1910.1000(d)(2)(i)		1555	2-327
1000(e)		2307	2-319
1000(e)		2507	2-326
1000(e)		3094	2-309
1000(f)(1)		3094	2-309
1000(f)(3)		3094	2-309
1001	CPL	2-2.40	2-331
1001(Appendix A)		4475	2-364

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1910.1001(Appendix A)	4476	2-365
1001(Appendix A)	4477	2-366
1001(Appendix B)	4475	2-364
1001(Appendix B)	4476	2-365
1001(Appendix B)	4477	2-366
1001(Appendix C)	1753	1-512
1001(Appendix C)	3923	3-394
1001(Appendix C)	4077	1-532
1001(Appendix E)	1343	1-12
1001(Appendix E)	1400	1-13
1001(a)	93011501	3-436.2
1001(a)(1)	1759	2-343
1001(a)(1)	2432	3-391
1001(b)	1865	3-377
1001(b)	2463	2-354
1001(b)	3900	2-359
1001(c)	3098	3-379
1001(d)(1)(ii)	4177	3-389
1001(d)(2)	1761	2-344
1001(d)(3)	1761	2-344
1001(d)(6)(i)	1599	2-339
1001(d)(6)(ii)	(3)001	2-336
1001(d)(6)(ii)	1542	2-337
1001(d)(6)(ii)	1599	2-339
1001(d)(6)(ii)	1827	2-346
1001(d)(6)(ii)	1896	2-348
1910.1001(d)(6)(ii)	2453	2-349
1001(d)(6)(ii)	4475	2-364
1001(d)(6)(ii)	4476	2-365
1001(d)(6)(ii)	4477	2-366
1001(e)(2)	1761	2-344
1001(f)(1)(iv)	3098	3-379
1001(f)(1)(iv)	3699	2-353
1001(f)(1)(ix)	1764	2-356
1001(f)(1)(vi)	1616	2-341
1001(f)(4)(ii)	1753	1-512
1001(g)(2)	1865	3-377
1001(g)(2)(i)	1602	2-340
1001(g)(2)(i)	1619	2-342
1001(g)(2)(i)	1651	1-445
1001(g)(2)(i)	1698	1-447
1001(g)(2)(i)	1868	1-459
1001(g)(2)(i)	2230	1-462
1910.1001(g)(2)(i)	2465	2-351
1001(g)(2)(ii)	2444	3-427
1001(g)(2)(ii)(A)	1534	1-507
1001(g)(2)(ii)(A)	2444	3-427
1001(g)(3)	3923	3-394
1001(g)(3)(iv)	2118	1-480
1001(g)(4)	1828	3-374
1001(g)(4)	1865	3-377
1001(g)(4)(ii)	2465	2-351
1001(g)(4)(ii)	3923	3-394
1001(g)(4)(ii)	4068	3-429
1001(g)(4)(ii)	4077	1-532
1001(g)(4)(ii)	92102001	1-537.6

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Standard Number	Record ID	Volume and Page No.
1910.1001(h)(1)	1893	3-217
1001(i)(4)	3362	2-352
1001(i)(4)	3856	2-357
1001(j)(2)(i)	1761	2-344
1001(j)(3)	2947	3-437
1001(k)(6)	3798	3-386
1001(k)(6)	4127	2-362
1001(l)(1)(i)	2463	2-354
1001(l)(1)(i)	3376	3-430
1001(l)(1)(ii)	3816	3-434
1001(l)(1)(ii)(A)	1864	2-347
1001(l)(2)	2463	2-354
1001(l)(2)(ii)	1864	2-347
1001(l)(3)	2463	2-354
1001(l)(4)	2463	2-354
1001(l)(7)(ii)	1723	3-435
1001(m)(3)	1176	1-9
1001(m)(3)	1343	1-12
1001(m)(3)	1400	1-13
1002	1357	2-430
1002	2115	2-368
1910.1002	2133	2-295
1002	2500	2-304
1003(a)(1)	1355	2373
1003(a)(1)	1470	2-374
1003(a)(2)	1330	2-371
1003(g)(1)(i)	STD 1-23.4	2-370
1004(a)(1)	1355	2-375
1004(a)(2)	1330	2-374
1006	PUB 8-1.2A	2-377
1006(a)(1)	1355	2-402
1006(a)(1)	1470	2-374
1006(a)(2)	1330	2-401
1006(c)(2)	2237	2-401
1006(c)(3)	2237	2-401
1006(g)(1)(i)	STD 1-23.4	2-370
1007(a)(1)	1355	2-405
1007(a)(2)	1330	2-404
1910.1008(a)(1)	1355	2-407
1008(a)(2)	1330	2-406
1008(c)(3)	2237	2-401
1008(c)(4)	2237	2-401
1008(d)(2)(iii)	2237	2-401
1009(a)(1)	1355	2-410
1009(a)(1)	1470	2-374
1009(a)(2)	1330	2-409
1009(g)(1)(i)	STD 1-23.4	2-370
1009(g)(2)(i)	2258	2-408
1010	3920	2-411
1010(a)(1)	1355	2-415
1010(a)(1)	1470	2-374
1010(a)(2)	1330	2-414
1010(g)(1)(i)	STD 1-23.4	2-370
1011(a)(1)	1355	2-418
1011(a)(2)	1330	2-417
1012(a)(1)	1355	2-420

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Standard Number		Record ID	Volume and Page No.
1910.1012(a)(2)		1330	2-419
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1013(a)(2)		1330	2-421
1014(a)(1)		1355	2-424
1014(a)(2)		1330	2-423
1015(a)(1)		1355	2-426
1015(a)(2)		1330	2-425
1016(a)(1)		1355	2-428
1016(a)(2)		1330	2-427
1017(b)		2508	2-432
1017(b)(5)		1327	2-429
1017(b)(5)		2508	2-432
1017(b)(6)		2393	2-436
1017(b)(7)		1347	2-434
1017(h)(1)		1347	2-434
1017(h)(1)(ii)		1426	2-435
1910.1017(k)		1327	2-429
1017(k)		1871	2-431
1017(k)(1)(i)		1871	2-431
1017(k)(2)		1871	2-431
1017(k)(3)		1871	2-431
1017(l)(2)		1347	2-434
1017(l)(4)		2393	2-436
1017(n)(2)		1327	2-429
1017(n)(2)		2508	2-432
1018	CPL	2-2.22	2-438
1018(a)		1331	2-447
1018(a)		1332	2-448
1018(h)(2)(ii)		1341	2-450
1018(h)(3)(ii)		1341	2-450
1018(h)(3)(ii)		92102001	1-537.6
1018(j)(1)(ii)		2216	1-420
1018(j)(1)(ii)		93021201	2-452.1
1910.1018(j)(2)(iii)		93021201	2-452.1
1018(j)(2)(iv)		93021201	2-452.1
1018(k)(2)		93031801	2-452.3
1018(m)(1)		93021201	2-452.1
1018(m)(2)(i)		1341	2-450
1018(m)(5)		2886	2-449
1018(m)(5)		93021201	2-452.1
1018(n)(1)(ii)		1341	2-450
1018(n)(1)(ii)		1342	2-452
1018(o)(1)(ii)		1341	2-450
1025		92102701	2-159.2
1025		93032401	1-412.113
1025	CPL	2-2.26A	2-255
1025(Appendix A)(II)		1745	2-468
1025(a)		92042401	1-412.86
1025(a)(1)		2209	2-477
1025(b)		92042401	1-412.86
1910.1025(c)(1)		2078	2-473
1025(c)(1)		2114	2-475
1025(d)		92042401	1-412.86
1025(d)(8)(i)		1207	2-460
1025(d)(8)(i)		1352	2-482
1025(d)(8)(ii)		1207	2-460

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1910.1025(e)(1)	1353	2-484
1025(e)(1)	1773	2-483
1025(e)(1)	2114	2-475
1025(e)(1)	CPL 2-2.47	2-453
1025(e)(2)	1353	2-484
1025(e)(2)	1639	2-465
1025(e)(2)	2114	2-475
1025(e)(3)	2114	2-475
1025(e)(3)	92042401	1-412.86
1025(f)(1)(i)	1639	2-465
1025(f)(2)	1353	2-484
1025(f)(2)(i)	1639	2-465
1025(f)(2)(i)	1887	2-472
1025(f)(2)(i)	2978	2-508
1025(f)(2)(ii)	1534	1-507
1025(f)(2)(ii)	1639	2-465
1025(f)(3)(ii)	1753	1-512
1025(f)(3)(ii)	1984	2-485
1025(f)(3)(ii)	92102001	1-537.6
1025(f)(3)(ii)	STP 2-1.108	2-496.1
1025(g)(1)(ii)	93021201	2-452.1
1025(g)(2)(iv)	93021201	2-452.1
1025(h)(2)	93031801	2-452.3
1025(h)(2)(ii)	1474	2-486
1025(h)(3)	1474	2-486
1025(h)(3)	93021201	2-452.1
1025(h)(3)(i)	1335	2-461
1025(i)(1)	1335	2-461
1910.1025(i)(2)	1639	2-465
1025(i)(2)(ii)	93021201	2-452.1
1025(i)(3)	1639	2-465
1025(i)(3)(i)	1354	2-487
1025(i)(4)	1639	2-465
1025(j)(1)(i)	2118	1-480
1025(j)(1)(iii)	1335	2-461
1025(j)(2)	2114	2-475
1025(j)(2)(i)	1745	2-468
1025(j)(2)(i)	2005	2-488
1025(j)(2)(i)(A)	4108	2-489
1025(j)(2)(i)(B)	4108	2-489
1025(j)(2)(i)(C)	4108	2-489
1025(j)(2)(ii)	4108	2-489
1025(j)(2)(iv)	1745	2-468
1025(j)(2)(iv)(B)	2078	2-473
1025(j)(3)	2252	2-480
1910.1025(j)(3)(i)	1539	2-463
1025(j)(3)(i)	1765	2-471
1025(j)(3)(i)	2005	2-488
1025(j)(3)(i)(B)	1801	2-492
1025(j)(3)(ii)	2005	2-488
1025(j)(3)(iii)	1765	2-471
1025(j)(3)(iii)(B)	1335	2-461
1025(j)(3)(iv)(B)	2251	2-478
1025(j)(3)(v)	2251	2-478
1025(k)(1)	1338	2-462
1025(k)(1)	2114	2-475

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Standard Number		Record ID	Volume and Page No.
1910.1025(k)(1)(i)		2078	2-473
1025(k)(1)(i)(D)		4108	2-489
1025(k)(1)(iii)		1775	2-494
1025(k)(1)(iii)		2251	2-478
1025(k)(1)(iii)		2252	2-480
1025(k)(2)(i)		1775	2-494
1025(k)(2)(i)		2251	2-478
1025(k)(2)(i)		2252	2-480
1025(k)(2)(ii)		2252	2-480
1025(k)(2)(v)(B)		1745	2-468
1025(k)(2)(vi)		1801	2-492
1025(k)(2)(vii)		1539	2-463
1025(k)(2)(vii)		1775	2-494
1025(k)(2)(vii)		1801	2-492
1025(k)(2)(vii)		2251	2-478
1025(l)(1)		2114	2-475
1025(l)(1)		92042401	1-412.86
1025(l)(1)(i)		(5)001	2-496
1025(l)(1)(v)(A)		(5)001	2-496
1025(n)(3)		1338	2-462
1025(n)(4)(ii)		1207	2-460
1025(q)		(5)001	2-496
1027	STP	2-1.169	2-496.3
1910.1028(Appendix C)		1861	2-514
1028(Appendix E)(7)		3923	3-394
1028(Appendix E)(C)(2)(b)		4077	1-532
1028(a)(1)		1668	2-497
1028(a)(2)(i)		1686	2-501
1028(a)(2)(i)		2937	2-513
1028(a)(2)(i)		3821	2-511
1028(a)(2)(ii)		1668	2-497
1028(a)(2)(v)		1686	2-501
1028(a)(2)(v)		2937	2-513
1028(b)		2929	2-507
1028(c)(1)		1683	2-500
1028(c)(1)		1838	2-505
1028(c)(1)	STP	2-1.139	2-515.1
1028(c)(2)		1683	2-500
1028(c)(2)	STP	2-1.139	2-515.1
1028(e)(4)(i)		2929	2-507
1910.1028(e)(5)(i)		1686	2-501
1028(e)(5)(ii)		1686	2-501
1028(e)(7)(i)		1686	2-501
1028(e)(7)(i)		2929	2-507
1028(f)(1)(i)		1686	2-501
1028(f)(2)(i)		1686	2-501
1028(g)(1)(ii)		1838	2-505
1028(g)(1)(ii)		2929	2-507
1028(g)(2)(i)		1838	2-505
1028(g)(2)(i)		2978	2-508
1028(g)(2)(i)		3361	2-510
1028(g)(2)(iii)		1838	2-505
1028(g)(4)(i)		2978	2-508
1028(g)(5)(i)		1838	2-505
1028(g)(5)(i)		3923	3-394
1028(g)(5)(i)		92102001	1-537.6

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1910.1028(g)(5)(ii)	1838	2-505
1028(g)(5)(ii)	4077	1-532
1028(i)(1)(i)	1672	2-499
1028(i)(1)(i)	1686	2-501
1028(i)(1)(i)	2118	1-480
1028(i)(2)(i)(A)	1861	2-514
1028(i)(3)(i)	1861	2-514
1028(i)(5)	1672	2-499
1028(i)(6)(iii)	2929	2-507
1028(i)(7)(i)(B)	1861	2-514
1028(j)(1)(i)	2929	2-507
1028(k)(2)(iii)	1686	2-501
1030	92051901	2-564.70
1030	92072801	2-564.85
1030	92072802	2-564.87
1030	92090901	2-564.95
1030	92102102	2-564.117
1030	92120401	2-564.138
1910.1030	92122101	2-564.123
1030	93012601	2-564.143
1030	93012603	2-564.156
1030	CPL 2-2.36	2-516
1030	CPL 2-2.44B	2-524
1030	STP 2-1.166	2-564.67
1030(Appendix A)	92081203	2-564.89
1030(a)	(5)015	2-564
1030(a)	92052801	2-564.73
1030(a)	92052901	2-564.77
1030(a)	92060101	2-564.76
1030(a)	92060102	2-564.160
1030(a)	92060301	2-564.78
1030(a)	92060302	2-564.79
1030(a)	92062501	2-564.80
1030(a)	92070702	2-564.83
1030(a)	92072101	2-564.84
1910.1030(a)	92072801	2-564.85
1030(a)	92080701	2-564.92
1030(a)	92081401	2-564.94
1030(a)	92082701	2-564.106
1030(a)	92082801	2-564.104
1030(a)	92090402	2-564.101
1030(a)	92090902	2-564.97
1030(a)	92100201	2-564.110
1030(a)	92100202	2-564.111
1030(a)	92100501	1-597.3
1030(a)	92100801	2-564.114
1030(a)	92102201	2-564.115
1030(a)	92102202	2-564.158
1030(a)	92102301	2-564.136
1030(a)	92110401	2-564.122
1030(a)	92110601	2-564.120
1030(a)	92120401	2-564.138
1910.1030(a)	92121502	2-564.129
1030(a)	92122101	2-564.123
1030(a)	93012601	2-564.143
1030(a)	93032301	2-564.127

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1910.1030(a)	93041301	2-564.152
1030(a)	93041901	2-564.128
1030(a)	D93043001	2-564.69
1030(b)	92051201	2-564.72
1030(b)	92051901	2-564.70
1030(b)	92052801	2-564.73
1030(b)	92060101	2-564.76
1030(b)	92060102	2-564.160
1030(b)	92060302	2-564.79
1030(b)	92062501	2-564.80
1030(b)	92072101	2-564.84
1030(b)	92072801	2-564.85
1030(b)	92080701	2-564.92
1030(b)	92081204	2-564.90
1030(b)	92081401	2-564.94
1030(b)	92082801	2-564.104
1030(b)	92100202	2-564.111
1030(b)	92100501	1-597.3
1030(b)	92100801	2-564.114
1030(b)	92102201	2-564.115
1030(b)	92102202	2-564.158
1030(b)	92102301	2-564.136
1030(b)	92110401	2-564.122
1030(b)	92120401	2-564.138
1030(b)	92121502	2-564.129
1030(b)	93021601	2-564.150
1030(b)	93041301	2-564.152
1030(b)	93062901	2-564.133
1030(b)	D93043001	2-564.69
1030(c)	92060301	2-564.78
1910.1030(c)	92100201	2-564.110
1030(c)(1)	92122101	2-564.123
1030(c)(1)(v)	93020101	2-564.147
1030(c)(2)	92060101	2-564.76
1030(c)(2)	92060102	2-564.160
1030(c)(2)	92060301	2-564.78
1030(c)(2)	92090402	2-564.101
1030(c)(2)	92090902	2-564.97
1030(c)(2)	92100201	2-564.110
1030(c)(2)	92100501	1-597.3
1030(c)(2)	92100801	2-564.114
1030(c)(2)	92102301	2-564.136
1030(c)(2)	92110401	2-564.122
1030(c)(2)	92120401	2-564.138
1030(c)(2)	93012601	2-564.143
1030(c)(2)	93012602	2-564.145
1030(c)(2)	93062901	2-564.133
1910.1030(c)(2)(i)	92060101	2-564.76
1030(c)(2)(i)	92093001	2-564.113
1030(c)(2)(i)	92100202	2-564.111
1030(c)(2)(i)(B)	92052801	2-564.73
1030(c)(2)(i)(B)	92060302	2-564.79
1030(c)(2)(i)(C)	92052801	2-564.73
1030(c)(2)(i)(C)	92060302	2-564.79
1030(c)(2)(i)(C)	92062501	2-564.80
1030(c)(2)(i)(C)	92072801	2-564.85

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1910.1030(d)(2)	3764	2-560
1030(d)(2)	92070702	2-564.83
1030(d)(2)	93012601	2-564.143
1030(d)(2)	93012603	2-564.156
1030(d)(2)(i)	92070702	2-564.83
1030(d)(2)(i)	92100203	2-564.112
1030(d)(2)(i)	93062901	2-564.133
1030(d)(2)(ix)	92090401	2-564.99
1030(d)(2)(v)	92081202	2-564.88
1030(d)(2)(vii)	3764	2-560
1030(d)(2)(vii)	92110401	2-564.122
1030(d)(2)(vii)(A)	92091501	2-564.108
1030(d)(2)(vii)(B)	2913	4-3
1030(d)(2)(vii)(B)	3764	2-560
1030(d)(2)(vii)(B)	4065	2-563
1030(d)(2)(vii)(B)	92091501	2-564.108
1030(d)(2)(vii)(B)	92100203	2-564.112
1030(d)(2)(xiii)	92051201	2-564.72
1030(d)(2)(xiii)	92060101	2-564.76
1030(d)(2)(xiii)	92060102	2-564.160
1030(d)(2)(xiii)(A)	92051201	2-564.72
1030(d)(3)	92060301	2-564.78
1030(d)(3)	92072101	2-564.84
1030(d)(3)	92100201	2-564.110
1910.1030(d)(3)(i)	3764	2-560
1030(d)(3)(i)	92060101	2-564.76
1030(d)(3)(i)	92060102	2-564.160
1030(d)(3)(i)	92070702	2-564.83
1030(d)(3)(i)	92090101	2-564.103
1030(d)(3)(i)	92091501	2-564.108
1030(d)(3)(i)	92093001	2-564.113
1030(d)(3)(i)	92111801	2-564.118
1030(d)(3)(ii)	3758	2-558
1030(d)(3)(ii)	92062501	2-564.80
1030(d)(3)(ii)	92091501	2-564.108
1030(d)(3)(ii)	93012602	2-564.145
1030(d)(3)(iii)	92091501	2-564.108
1030(d)(3)(iv)	92091501	2-564.108
1030(d)(3)(iv)	93012602	2-564.145
1030(d)(3)(iv)	93041901	2-564.128
1030(d)(3)(ix)	92041501	2-564.125
1910.1030(d)(3)(ix)	92051801	2-564.71
1030(d)(3)(ix)	92111801	2-564.118
1030(d)(3)(v)	92091501	2-564.108
1030(d)(4)(ii)(A)	3758	2-558
1030(d)(4)(ii)(A)	92051901	2-564.70
1030(d)(4)(ii)(A)	92072802	2-564.87
1030(d)(4)(ii)(A)	92102102	2-564.117
1030(d)(4)(ii)(A)	93062901	2-564.133
1030(d)(4)(iii)	3764	2-560
1030(d)(4)(iii)(A)	93062901	2-564.133
1030(d)(4)(iii)(A)(iii)	92070701	2-564.82
1030(d)(4)(iii)(B)	92060101	2-564.76
1030(d)(4)(iii)(B)	92060102	2-564.160
1030(d)(4)(iii)(C)	92060101	2-564.76
1030(d)(4)(iii)(C)	92060102	2-564.160

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Standard Number	Record ID	Volume and Page No.
1910.1030(d)(4)(iv)(A)	92091501	2-564.108
1030(d)(4)(iv)(A)	93012601	2-564.143
1030(d)(4)(iv)(A)	93012602	2-564.145
1030(d)(4)(iv)(A)	93012603	2-564.156
1030(d)(4)(iv)(A)(1)	93012601	2-564.143
1030(d)(4)(iv)(A)(1)	93012603	2-564.156
1030(d)(4)(iv)(A)(2)	93012602	2-564.145
1030(d)(4)(iv)(C)	92091501	2-564.108
1030(f)	92060101	2-564.76
1030(f)	92060102	2-564.160
1030(f)	92060301	2-564.78
1030(f)	92072101	2-564.84
1030(f)	92100201	2-564.110
1030(f)(1)	92070702	2-564.83
1030(f)(1)	92072801	2-564.85
1030(f)(1)	92100202	2-564.111
1030(f)(1)	92102201	2-564.115
1030(f)(1)	92102202	2-564.158
1030(f)(1)	92102301	2-564.136
1910.1030(f)(1)	92120401	2-564.138
1030(f)(1)	92121502	2-564.129
1030(f)(1)	93062901	2-564.133
1030(f)(1)(i)	92052802	2-564.75
1030(f)(1)(i)	92081203	2-564.89
1030(f)(1)(i)	92082701	2-564.106
1030(f)(1)(i)	92082801	2-564.104
1030(f)(1)(i)	93020101	2-564.147
1030(f)(1)(ii)	92052802	2-564.75
1030(f)(1)(ii)(A)	92111801	2-564.118
1030(f)(1)(ii)(B)	93020101	2-564.147
1030(f)(2)(i)	3859	4-52
1030(f)(2)(i)	92081203	2-564.89
1030(f)(2)(i)	93020101	2-564.147
1030(f)(3)	92102301	2-564.136
1030(f)(3)(ii)	92090402	2-564.101
1030(f)(5)	93020101	2-564.147
1910.1030(f)(5)(i)	93020101	2-564.147
1030(f)(5)(iv)	93020101	2-564.147
1030(g)(1)	92060101	2-564.76
1030(g)(1)	92060102	2-564.160
1030(g)(1)(i)	92102101	2-564.116
1030(g)(1)(i)	92102201	2-564.115
1030(g)(1)(i)(A)	4096	3-46
1030(g)(1)(i)(B)	4096	3-46
1030(g)(1)(i)(E)	92082101	2-564.107
1030(g)(1)(i)(F)	93041301	2-564.152
1030(g)(2)	92060301	2-564.78
1030(g)(2)	92070702	2-564.83
1030(g)(2)	92072101	2-564.84
1030(g)(2)	92100201	2-564.110
1030(g)(2)	92120401	2-564.138
1030(g)(2)	93012602	2-564.145
1030(g)(2)	93041301	2-564.152
1910.1030(g)(2)	93062901	2-564.133
1030(g)(2)(i)	92081204	2-564.90
1030(g)(2)(i)	D93043001	2-564.69

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Standard Number	Record ID	Volume and Page No.
1910.1030(g)(2)(ii)	93020201	2-564.154
1030(g)(2)(iv)	93020201	2-564.154
1030(g)(2)(v)	93020201	2-564.154
1030(g)(2)(vi)	92100201	2-564.110
1030(g)(2)(vii)	92100201	2-564.110
1030(g)(2)(vii)	93020201	2-564.154
1030(g)(2)(vii)	D93043001	2-564.69
1030(g)(2)(vii)(N)	92041503	2-564.126
1030(g)(2)(vii)(N)	92100201	2-564.110
1030(g)(2)(viii)	92041503	2-564.126
1030(g)(2)(viii)	92111801	2-564.118
1030(h)(1)(ii)	92060101	2-564.76
1030(h)(1)(ii)	92060102	2-564.160
1030(h)(1)(ii)(B)	93020101	2-564.147
1910.1030(h)(1)(iv)	92060101	2-564.76
1030(h)(1)(iv)	92060102	2-564.160
1030(h)(3)(iii)	92060101	2-564.76
1030(h)(3)(iii)	92060102	2-564.160
1030(l)(1)(i)	92082801	2-564.104
1043	4229	2-585
1043(Appendix A)	4229	2-585
1043(Appendix B)	4229	2-585
1043(Appendix C)	4229	2-585
1043(Appendix D)	1609	2-584
1043(Appendix D)	3052	2-581
1043(a)	(5)022	2-568
1043(a)	(5)024	2-570
1043(a)(1)	1597	2-575
1043(a)(1)	1794	2-579
1043(a)(2)	(5)023	2-569
1043(a)(2)	1597	2-575
1910.1043(a)(3)	(5)029	2-580
1043(a)(3)	4229	2-585
1043(a)(6)	(5)026	2-576
1043(b)	(5)024	2-570
1043(b)	(5)032	2-587
1043(b)	1219	2-593
1043(b)	2067	2-588
1043(b)	2491	2-594
1043(b)	4229	2-585
1043(c)(1)	2507	2-326
1043(c)(1)(i)	(5)026	2-576
1043(c)(1)(i)	2067	2-588
1043(c)(1)(ii)	(5)022	2-568
1043(c)(1)(iii)	2067	2-588
1043(c)(2)	1782	2-578
1043(c)(3)(iii)	1782	2-578
1043(d)(1)(ii)	(5)021	2-567
1910.1043(d)(1)(iii)	(5)034	2-589
1043(d)(1)(iii)	(5)035	2-590
1043(d)(1)(iii)	2503	2-591
1043(d)(1)(iv)	(5)035	2-590
1043(d)(1)(iv)	2503	2-591
1043(d)(2)	(5)026	2-576
1043(d)(3)(ii)	(5)021	2-567
1043(f)(1)	1203	1-503

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Standard Number	Record ID	Volume and Page No.
1910.1043(f)(2)(i)	1799	1-458
1043(f)(2)(v)	(5)022	2-568
1043(f)(4)(i)	2507	2-326
1043(h)	4229	2-585
1043(h)(1)(ii)	(5)024	2-570
1043(h)(1)(iii)	(5)024	2-570
1043(h)(1)(iii)	1221	2-565
1043(h)(2)	(5)020	2-566
1043(h)(2)	(5)024	2-570
1043(h)(2)	2491	2-594
1043(h)(2)(i)	(5)024	2-570
1043(h)(2)(ii)	(5)024	2-570
1043(h)(2)(ii)	2491	2-594
1043(h)(2)(iii)	(5)024	2-570
1043(h)(2)(iii)	1219	2-593
1043(h)(2)(iii)	2491	2-594
1043(h)(3)(i)	(5)024	2-570
1043(h)(3)(ii)	1219	2-593
1043(h)(3)(ii)(A)	(5)024	2-570
1043(h)(3)(ii)(C)	(5)024	2-570
1043(h)(3)(ii)(C)	2491	2-594
1043(h)(4)(i)	(5)024	2-570
1043(h)(5)(i)	(5)024	2-570
1043(h)(5)(ii)	(5)024	2-570
1043(i)(1)(ii)	(5)026	2-576
1043(k)(2)	4229	2-585
1910.1043(k)(3)	4229	2-585
1043(k)(4)	4229	2-585
1045(Appendix A)(III)(F)	1740	3-1
1045(b)	1257	3-2
1045(h)(3)(iii)	92102001	1-537.6
1045(j)(1)	1257	3-2
1045(j)(2)(iii)	1257	3-2
1045(m)(1)	1257	3-2
1045(m)(2)	1257	3-2
1045(m)(3)	1257	3-2
1047	STP 2-1.148	3-20.3
1047(Appendix B)(III)	2200	3-11
1047(Appendix B)(IV)(A)(2)	2487	3-15
1047(a)(1)	2200	3-11
1047(a)(2)	1807	3-194
1047(a)(3)	1807	3-194
1047(b)	2200	3-11
1910.1047(b)	3541	3-16
1047(c)(1)	3541	3-16
1047(c)(2)	3541	3-16
1047(c)(2)	STP 2-1.148	3-20.3
1047(d)(6)	2487	3-15
1047(f)(1)(i)	1659	3-6
1047(f)(1)(ii)	1659	3-6
1047(f)(1)(iii)	1659	3-6
1047(g)(2)	2316	1-493
1047(h)(1)	1733	3-8
1047(h)(1)	2200	3-11
1047(h)(1)(ii)	1731	3-19
1047(h)(2)	1731	3-19

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Standard Number	Record ID		Volume and Page No.
1910.1047(h)(2)		1733	3-8
1047(h)(2)		2200	3-11
1047(h)(2)		3541	3-16
1047(j)(1)(i)		1807	3-194
1047(j)(1)(ii)		2312	3-13
1047(j)(1)(ii)		93092701	3-277.14
1047(j)(1)(ii)	STP	2-1.122	3-20.1
1047(j)(1)(iii)		2312	3-13
1047(j)(1)(iii)	STP	2-1.122	3-20.1
1047(j)(2)		93092701	3-277.14
1047(j)(3)(i)		1807	3-194
1047(k)(1)(i)		1807	3-194
1047(k)(1)(ii)		1807	3-194
1047(k)(1)(iii)		1807	3-194
1048	CPL	2-2.52	3-21
1048	CPL	2-2.52CH-1	3-51.1
1048	STP	2-1.144	3-38
1048	STP	2-1.144A	3-51.7
1048(Appendix A)		1909	3-221
1048(Appendix B)		2934	3-40
1048(Appendix E)(I)		4077	1-532
1910.1048(a)		3350	3-42
1048(d)(1)		2934	3-40
1048(d)(1)(ii)(B)		2934	3-40
1048(e)(1)		4096	3-46
1048(f)(1)		3350	3-42
1048(g)(1)	STP	2-1.144A	3-51.7
1048(g)(2)(i)		3350	3-42
1048(g)(2)(ii)		92102001	1-537.6
1048(g)(3)(ii)		4077	1-532
1048(h)(1)		1858	3-48
1048(h)(1)(ii)		1858	3-48
1048(h)(1)(iii)		3350	3-42
1048(h)(1)(iv)		3350	3-42
1048(h)(2)(vi)		4096	3-46
1048(i)(2)		2934	3-40
1048(i)(3)		2934	3-40
1048(j)(3)		2934	3-40
1910.1048(j)(4)		4096	3-46
1048(k)		2934	3-40
1048(l)(1)(ii)		3802	3-50
1048(l)(2)		3802	3-50
1048(l)(4)		2118	1-480
1048(l)(4)		3802	3-50
1048(l)(4)(i)		1858	3-48
1048(l)(9)	STP	2-1.144A	3-51.7
1048(m)(1)	STP	2-1.144A	3-51.7
1048(m)(2)		1939	3-134
1048(m)(3)(i)		1909	3-221
1048(m)(3)(i)		1939	3-134
1048(m)(3)(i)		2412	3-226
1048(m)(3)(i)		4096	3-46
1048(m)(3)(ii)		4096	3-46
1048(m)(3)(ii)	STP	2-1.144A	3-51.7
1048(n)(2)	STP	2-1.144A	3-51.7
1048(n)(3)(i)		1939	3-134

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1910.1200	CPL	2-2.38C	3-52
1200	STD	1-23.2	2-216
1200	STD	2.1	3-89
1200	STP	2-1.113A	3-277.1
1200	STP	2-1.140	3-277.3
1200(Appendix A)		1697	3-108
1200(Appendix A)		1757	3-112
1200(Appendix A)		1893	3-217
1200(Appendix A)		1912	3-223
1200(Appendix A)		1940	3-135
1200(Appendix A)(2)		1927	3-206
1200(Appendix A)(7)		1697	3-108
1200(Appendix A)(7)		3739	3-180
1200(Appendix B)		1912	3-223
1200(Appendix B)		1955	3-208
1200(Appendix C)		1954	3-140
1910.1200(a)		92072804	1-131.1
1200(a)(1)		93022501	3-277.19
1200(a)(2)		4085	3-198
1200(a)(2)		4119	3-214
1200(a)(2)		4185	3-185
1200(a)(2)		4187	3-187
1200(a)(2)		4368	3-103
1200(b)		1923	3-126
1200(b)		1928	3-224
1200(b)(1)		1813	3-114
1200(b)(1)		1899	3-121
1200(b)(1)		1921	3-125
1200(b)(1)		1923	3-126
1200(b)(1)		1935	3-133
1200(b)(1)		1940	3-135
1200(b)(1)		1948	3-237
1200(b)(1)		2420	3-169
1910.1200(b)(1)		2972	3-265
1200(b)(1)		3083	3-175
1200(b)(1)		3316	3-178
1200(b)(1)		3347	3-251
1200(b)(1)		4106	1-344
1200(b)(1)		4187	3-187
1200(b)(1)		4394	1-323
1200(b)(1)		4493	3-276
1200(b)(1)		93022501	3-277.19
1200(b)(1)	STP	2-1.125	3-91
1200(b)(1)	STP	2-1.140	3-277.3
1200(b)(2)		1813	3-114
1200(b)(2)		1902	3-123
1200(b)(2)		1924	3-239
1200(b)(2)		1932	3-129
1200(b)(2)		1933	3-131
1200(b)(2)		1934	3-132
1910.1200(b)(2)		1940	3-135
1200(b)(2)		1942	3-196
1200(b)(2)		1945	3-136
1200(b)(2)		1949	3-138
1200(b)(2)		1956	3-141
1200(b)(2)		1960	3-244

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Standard Number	Record ID	Volume and Page No.
1910.1200(b)(2)	2972	3-265
1200(b)(2)	3056	3-204
1200(b)(2)	3314	3-229
1200(b)(2)	4078	3-192
1200(b)(2)	4085	3-198
1200(b)(2)	4397	3-273
1200(b)(2)	4409	3-183
1200(b)(2)	93022501	3-277.19
1200(b)(3)	4104	3-284
1200(b)(3)	4105	3-286
1200(b)(3)	4352	3-289
1200(b)(3)(i)	4105	3-286
1200(b)(3)(ii)	1877	3-116
1200(b)(4)	1900	3-122
1200(b)(4)	1923	3-126
1200(b)(4)(iii)	1900	3-122
1200(b)(5)(i)	1938	3-200
1200(b)(5)(i)	2312	3-13
1200(b)(5)(i)	4347	3-190
1200(b)(5)(ii)	2276	3-150
1200(b)(5)(iv)	2420	3-169
1200(b)(6)	4397	3-273
1200(b)(6)	4493	3-276
1200(b)(6)(i)	1700	3-109
1200(b)(6)(i)	3845	1-304
1200(b)(6)(i)	4124	1-373
1200(b)(6)(i)	4394	1-323
1200(b)(6)(iv)	4085	3-198
1910.1200(b)(6)(v)	2911	3-246
1200(b)(6)(vii)	1564	3-95
1200(b)(6)(vii)	1813	3-114
1200(b)(6)(vii)	1898	3-119
1200(b)(6)(vii)	1923	3-126
1200(b)(6)(vii)	1932	3-129
1200(b)(6)(vii)	1934	3-132
1200(b)(6)(vii)	1936	3-201
1200(b)(6)(vii)	1938	3-200
1200(b)(6)(vii)	1946	3-137
1200(b)(6)(vii)	2972	3-265
1200(b)(6)(vii)	4493	3-276
1200(b)(6)(vii)	93022501	3-277.19
1200(b)(6)(viii)	1936	3-201
1200(b)(6)(viii)	2911	3-246
1200(b)(6)(viii)	3420	3-257
1200(b)(6)(viii)	4493	3-276
1910.1200(c)	1697	3-108
1200(c)	1757	3-112
1200(c)	1860	3-115
1200(c)	1891	3-266
1200(c)	1893	3-217
1200(c)	1899	3-121
1200(c)	1912	3-223
1200(c)	1923	3-126
1200(c)	1928	3-224
1200(c)	1933	3-131
1200(c)	1944	3-264

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1910.1200(c)	1949	3-138
1200(c)	1954	3-140
1200(c)	1960	3-244
1200(c)	2142	3-202
1200(c)	2282	3-153
1200(c)	2294	3-156
1200(c)	2303	3-158
1200(c)	2398	3-166
1200(c)	2420	3-169
1200(c)	2932	3-227
1200(c)	3056	3-204
1200(c)	4085	3-198
1200(c)	4363	3-99
1200(c)	4493	3-276
1200(c)	93022501	3-277.19
1200(c)	STP 2-1.133	3-92
1200(c)(i)	1954	3-140
1200(d)(1)	1893	3-217
1200(d)(1)	1923	3-126
1200(d)(1)	1927	3-206
1200(d)(1)	1956	3-141
1200(d)(1)	2276	3-150
1200(d)(1)	2303	3-158
1910.1200(d)(1)	2397	3-164
1200(d)(1)	2420	3-169
1200(d)(1)	4187	3-187
1200(d)(1)	92122201	3-277.17
1200(d)(1)	93022501	3-277.19
1200(d)(2)	1898	3-119
1200(d)(2)	1902	3-123
1200(d)(2)	1905	3-205
1200(d)(2)	1909	3-221
1200(d)(2)	1912	3-223
1200(d)(2)	1923	3-126
1200(d)(2)	1925	3-128
1200(d)(2)	1954	3-140
1200(d)(2)	1956	3-141
1200(d)(2)	2276	3-150
1200(d)(2)	3002	3-172
1200(d)(3)	1860	3-115
1910.1200(d)(3)	1898	3-119
1200(d)(3)(i)	1727	3-110
1200(d)(3)(i)	1902	3-123
1200(d)(3)(i)	1905	3-205
1200(d)(3)(i)	2399	3-167
1200(d)(3)(i)	4185	3-185
1200(d)(3)(ii)	1580	3-106
1200(d)(3)(ii)	1905	3-205
1200(d)(3)(ii)	2399	3-167
1200(d)(3)(ii)	4185	3-185
1200(d)(4)	(3)328	3-102
1200(d)(4)	1727	3-110
1200(d)(4)	1898	3-119
1200(d)(4)	3316	3-178
1200(d)(4)	4368	3-103
1200(d)(4)	92101601	3-277.21

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1910.1200(d)(4)(ii)	3002	3-172
1200(d)(5)	(3)328	3-102
1200(d)(5)(i)	2145	3-143
1200(d)(5)(i)	2362	3-161
1200(d)(5)(ii)	1807	3-194
1200(d)(5)(ii)	1902	3-123
1200(d)(5)(ii)	1904	3-124
1200(d)(5)(ii)	1955	3-208
1200(d)(5)(ii)	2362	3-161
1200(d)(5)(iii)	2145	3-143
1200(d)(5)(iv)	1807	3-194
1200(d)(5)(iv)	1942	3-196
1200(d)(5)(iv)	2145	3-143
1200(d)(5)(iv)	2362	3-161
1200(d)(5)(iv)	2932	3-227
1200(d)(5)(iv)	3855	3-209
1200(d)(5)(iv)	4116	3-232
1200(d)(6)	1572	3-98
1910.1200(e)(1)	1951	3-139
1200(e)(1)	3749	3-210
1200(e)(1)	STP 2-1.140	3-277.3
1200(e)(1)(i)	92122201	3-277.17
1200(e)(2)	1936	3-201
1200(e)(2)	3083	3-175
1200(e)(2)	3749	3-210
1200(e)(2)(ii)	1932	3-129
1200(e)(2)(iii)	4400	1-328
1200(e)(3)	1913	3-270
1200(e)(3)	3850	3-279
1200(e)(3)	4119	3-214
1200(e)(3)	4352	3-289
1200(e)(4)	1951	3-139
1200(e)(4)	3749	3-210
1200(e)(4)	4119	3-214
1200(f)	93051501	3-277.10
1910.1200(f)	93092701	3-277.14
1200(f)(1)	1569	3-96
1200(f)(1)	1938	3-200
1200(f)(1)	2142	3-202
1200(f)(1)	4347	3-190
1200(f)(1)	92020601	3-277.6
1200(f)(1)(i)	1860	3-115
1200(f)(1)(i)	1955	3-208
1200(f)(1)(i)	2932	3-227
1200(f)(1)(i)	3314	3-229
1200(f)(1)(ii)	1757	3-112
1200(f)(1)(ii)	1893	3-217
1200(f)(1)(ii)	1903	3-219
1200(f)(1)(ii)	1911	3-222
1200(f)(1)(ii)	1927	3-206
1200(f)(1)(ii)	1975	3-225
1200(f)(1)(ii)	2164	3-147
1200(f)(1)(ii)	2303	3-158
1200(f)(1)(ii)	2412	3-226
1200(f)(1)(ii)	3002	3-172
1200(f)(1)(ii)	4368	3-103

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Standard Number	Record ID	Volume and Page No.
1910.1200(f)(1)(iii)	2161	3-145
1200(f)(2)	1879	3-216
1200(f)(2)	1921	3-125
1200(f)(2)	1945	3-136
1200(f)(2)	1949	3-138
1200(f)(2)	1954	3-140
1200(f)(2)	2303	3-158
1200(f)(3)	1757	3-112
1200(f)(3)	2280	3-151
1200(f)(3)	2294	3-156
1200(f)(3)	2402	3-168
1200(f)(3)	4056	3-230
1200(f)(3)	4363	3-99
1910.1200(f)(4)	1909	3-221
1200(f)(4)	1958	3-142
1200(f)(4)	2164	3-147
1200(f)(4)	2393	2-436
1200(f)(4)	2412	3-226
1200(f)(4)	2932	3-227
1200(f)(4)	3002	3-172
1200(f)(4)	4096	3-46
1200(f)(4)	4116	3-232
1200(f)(4)	4368	3-103
1200(f)(5)	1879	3-216
1200(f)(5)	1893	3-217
1200(f)(5)	1911	3-222
1200(f)(5)	1928	3-224
1200(f)(5)	1939	3-134
1200(f)(5)	2280	3-151
1200(f)(5)	2282	3-153
1910.1200(f)(5)	2294	3-156
1200(f)(5)	2398	3-166
1200(f)(5)	2976	3-171
1200(f)(5)(i)	3739	3-180
1200(f)(5)(ii)	1903	3-219
1200(f)(5)(ii)	2294	3-156
1200(f)(5)(ii)	3739	3-180
1200(f)(6)	1879	3-216
1200(f)(6)	1903	3-219
1200(f)(6)	1907	3-220
1200(f)(6)	1928	3-224
1200(f)(6)	1939	3-134
1200(f)(6)	2142	3-202
1200(f)(7)	1879	3-216
1200(f)(7)	1903	3-219
1200(f)(7)	1907	3-220
1200(f)(7)	2142	3-202
1910.1200(f)(7)	3739	3-180
1200(f)(7)	4347	3-190
1200(f)(9)	1941	3-235
1200(g)(1)	1907	3-220
1200(g)(1)	1925	3-128
1200(g)(1)	1935	3-133
1200(g)(1)	1949	3-138
1200(g)(1)	1954	3-140
1200(g)(1)	1960	3-244

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Standard Number	Record ID	Volume and Page No.
1910.1200(g)(1)	2282	3-153
1200(g)(1)	2402	3-168
1200(g)(1)	3344	3-248
1200(g)(1)	3420	3-257
1200(g)(1)	93022501	3-277.19
1200(g)(1)(i)(B)	1904	3-124
1200(g)(10)	1882	3-117
1200(g)(10)	1891	3-266
1200(g)(10)	1914	3-236
1200(g)(10)	1959	3-242
1200(g)(10)	1962	3-245
1200(g)(10)	2283	3-155
1200(g)(10)	2326	3-160
1200(g)(10)	2397	3-164
1200(g)(10)	2976	3-171
1200(g)(10)	3344	3-248
1200(g)(10)	3420	3-257
1200(g)(10)	3852	3-268
1200(g)(2)	2326	3-160
1200(g)(2)	92101601	3-277.21
1200(g)(2)	93022501	3-277.19
1200(g)(2)(i)(B)	1960	3-244
1200(g)(2)(i)(B)	2142	3-202
1200(g)(2)(i)(B)	2145	3-143
1200(g)(2)(i)(B)	2162	3-146
1910.1200(g)(2)(i)(B)	4187	3-187
1200(g)(2)(i)(B)(2)	1807	3-194
1200(g)(2)(i)(C)	92122201	3-277.17
1200(g)(2)(i)(C)(1)	1955	3-208
1200(g)(2)(i)(C)(1)	1960	3-244
1200(g)(2)(i)(C)(1)	2162	3-146
1200(g)(2)(i)(C)(1)	93092701	3-277.14
1200(g)(2)(i)(C)(2)	3314	3-229
1200(g)(2)(i)(C)(2)	3855	3-209
1200(g)(2)(i)(C)(2)	93092701	3-277.14
1200(g)(2)(i)(C)(3)(xii)	92122201	3-277.17
1200(g)(2)(iii)	1907	3-220
1200(g)(2)(iii)	2164	3-147
1200(g)(2)(iii)	2411	3-260
1200(g)(2)(iv)	2164	3-147
1200(g)(2)(iv)	2411	3-260
1200(g)(2)(vi)	2164	3-147
1910.1200(g)(2)(vi)	2399	3-167
1200(g)(2)(vii)	2164	3-147
1200(g)(2)(vii)	2388	3-162
1200(g)(2)(vii)	3316	3-178
1200(g)(2)(xii)	2411	3-260
1200(g)(2)(xii)	3420	3-257
1200(g)(3)	1657	3-107
1200(g)(3)	1914	3-236
1200(g)(3)	2388	3-162
1200(g)(3)	2397	3-164
1200(g)(3)	2411	3-260
1200(g)(3)	46	3-94
1200(g)(3)(xii)	2161	3-145
1200(g)(4)	2162	3-146

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Standard Number	Record ID	Volume and Page No.
1910.1200(g)(4)	2166	3-149
1200(g)(5)	92020601	3-277.6
1200(g)(6)	1882	3-117
1200(g)(6)	1893	3-217
1200(g)(6)	1923	3-126
1200(g)(6)	1926	3-262
1200(g)(6)	1937	3-240
1200(g)(6)	1959	3-242
1200(g)(6)	3347	3-251
1200(g)(6)	4187	3-187
1200(g)(6)	4397	3-273
1200(g)(6)	4409	3-183
1200(g)(6)	4493	3-276
1200(g)(7)	1924	3-239
1200(g)(7)	1926	3-262
1200(g)(7)	1937	3-240
1200(g)(7)	1944	3-264
1200(g)(7)	1959	3-242
1200(g)(7)	2972	3-265
1200(g)(7)	3347	3-251
1910.1200(g)(7)	4493	3-276
1200(g)(8)	1891	3-266
1200(g)(8)	1920	3-238
1200(g)(8)	1951	3-139
1200(g)(8)	1962	3-245
1200(g)(8)	2283	3-155
1200(g)(8)	3852	3-268
1200(g)(9)	1891	3-266
1200(g)(9)	1962	3-245
1200(g)(9)	2972	3-265
1200(g)(9)	3344	3-248
1200(g)(9)	3749	3-210
1200(h)	1913	3-270
1200(h)	1952	3-271
1200(h)	1953	3-272
1200(h)	1967	1-376
1200(h)	2142	3-202
1910.1200(h)	3317	1-300
1200(h)	4107	1-389
1200(h)	4119	3-214
1200(h)	92042401	1-412.86
1200(h)	92081201	1-412.61
1200(h)	93090701	3-277.13
1200(h)(1)	3853	1-364
1200(h)(1)(ii)	1932	3-129
1200(h)(1)(ii)	4397	3-273
1200(h)(1)(iii)	3852	3-268
1200(h)(2)	1910	3-269
1200(h)(2)	1913	3-270
1200(h)(2)	4394	1-323
1200(h)(2)	92081204	2-564.90
1200(h)(2)	93090701	3-277.13
1200(h)(2)(i)	1893	3-217
1200(h)(2)(i)	1934	3-132
1200(h)(2)(i)	4078	3-192
1200(h)(2)(i)	4394	1-323

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Standard Number		Record ID	Volume and Page No.
1910.1200(h)(2)(ii)		1910	3-269
1200(h)(2)(ii)		1925	3-128
1200(h)(2)(iii)		1882	3-117
1200(h)(2)(iii)		4394	1-323
1200(h)(2)(iii)		4400	1-328
1200(h)(2)(iii)		92121601	1-110.1.3
1200(h)(2)(iv)		1913	3-270
1200(h)(2)(iv)		3739	3-180
1200(h)(2)(iv)		4119	3-214
1200(i)	STP	2-1.133	3-92
1200(j)		2155	3-144
1450	STP	2-1.159	3-297.1
1450(Appendix A)		1742	1-124
1450(Appendix A)(C)(4)(b)		1470	2-374
1450(Appendix A)(C)(4)(h)		1742	1-124
1910.1450(a)	STP	2-1.159	3-297.1
1450(a)(1)		3791	3-278
1450(a)(1)		4066	3-283
1450(a)(1)		4104	3-284
1450(a)(1)		4105	3-286
1450(a)(1)		4113	3-287
1450(a)(1)		4165	3-294
1450(a)(1)		4352	3-289
1450(a)(2)		3776	3-293
1450(a)(2)(i)		1355	2-373
1450(a)(3)		4165	3-294
1450(a)(3)(i)		3752	3-291
1450(a)(3)(i)		3791	3-278
1450(a)(3)(i)		4105	3-286
1450(a)(3)(i)		4113	3-287
1450(a)(3)(ii)		4066	3-283
1450(a)(3)(ii)		4104	3-284
1910.1450(b)		3752	3-291
1450(b)		3800	3-292
1450(b)		4104	3-284
1450(b)		4113	3-287
1450(b)		92062405	1-276.4
1450(b)	STP	2-1.159	3-297.1
1450(e)	STP	2-1.159	3-297.1
1450(e)(1)(i)		4352	3-289
1450(e)(1)(iii)		1742	1-124
1450(e)(3)		3850	3-279
1450(e)(3)(ii)		3800	3-292
1450(e)(3)(iii)		1742	1-124
1450(e)(3)(viii)		3776	3-293
1450(e)(3)(viii)		3800	3-292
1450(g)(4)(ii)		4059	3-281
1915.			
2	STD	.2	3-298
35(a)(1)(i)		3353	1-500
36(a)(2)		3353	1-500
36(a)(6)		3353	1-500
55(d)(5)		1842	3-310
55(e)(3)		1226	3-305
73(b)		1228	3-312
94		3353	1-500

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Standard Number	Record ID		Volume and Page No.
1915.98	CPL	2-2.53	1-572
99	CPL	2-2.38C	3-52
110	CPL	2.32A	3-316
115(a)(1)		2129	3-315
135(c)(3)	STD	1-13.2A	2-152
177		2222	2-24
252	CPL	2.32ACH-2	3-320.1
1917.			
1(a)(1)(iii)		1466	3-319
1(a)(2)(i)		92013001	1-21.3
26	CPL	2-2.53	1-572
28	CPL	2-2.38C	3-52
45(g)(3)		2212	3-526
45(g)(3)(i)		2179	2-47
46(a)(1)(iii)		D9308033	3-531.3
71(b)(4)(i)	STD	2.2	3-318
152(d)(3)(iv)		1842	3-310
252	CPL	2.32ACH-2	3-320.1
1918.			
12(Appendix I)		4213	3-325
12(a)		4213	3-325
12(c)		4213	3-325
12(d)		4213	3-325
13(a)		2129	3-315
13(b)		2129	3-315
13(c)		2129	3-315
13(d)		2129	3-315
20	STD	2-1.8	3-321
32(b)		1275	3-329
32(b)	CPL	2-1.17	3-327
51(a)		4213	3-325
51(b)		4213	3-325
51(b)	STD	2-1.9	3-322
74(a)(6)		1420	3-334
74(a)(8)	STD	2-1.9	3-322
74(a)(9)	STD	2-1.4A	3-330
1918.74(a)(9)(ii)		2131	3-331
74(a)(9)(ii)	STD	2-1.7	3-332
74(a)(9)(viii)(d)		1407	3-333
74(a)(9)(viii)(d)	STD	2-1.7	3-332
85(b)(3)	STD	2.2	3-318
90	CPL	2-2.38C	3-52
96	CPL	2-2.53	1-572
106(a)		2296	3-335
110	CPL	2.32A	3-316
120		92013001	1-21.3
1918.177		2222	2-24
252	CPL	2.32ACH-2	3-320.1
1926.			
1		1230	3-340
1		1466	3-319
1		1541	3-477
1		4128	1-19
12(b)		92091801	3-457.1
12(c)		92091801	3-457.1
20	STD	3-1.1	1-1

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Standard Number	Record ID		Volume and Page No.
1926.20(b)(1)		92020401	3-479.2
20(b)(2)		91010901	3-553.3
21	STD	3-1.1	1-1
21(b)(2)		4413	1-403
21(b)(2)		91010901	3-553.3
21(b)(2)		92092101	3-340.3
21(b)(2)		92102302	3-532.2
21(b)(2)		92110601	2-564.120
21(b)(2)		93012601	2-564.143
21(b)(2)		93032301	2-564.127
21(b)(2)		D9310023	3-444.1
21(b)(2)		D9310053	3-444.6
21(b)(6)(ii)		92061501	3-340.1
23	STD	3-1.1	1-1
25(a)(1)		92110601	2-564.120
25(c)		92110601	2-564.120
25(c)		93012601	2-564.143
25(c)		93032301	2-564.127
28		93012601	2-564.143
28(5)(a)		93012601	2-564.143
28(a)		1446	3-344
28(a)		1711	3-348
28(a)		2007	3-349
28(a)		2194	3-345
28(a)		92052101	3-457.7
28(a)	STD	3-3.1	3-341
32(d)		92102302	3-532.2
1926.32(f)		92041506	3-350.1
32(f)		93080501	3-531.7
32(l)		1701	3-350
32(l)		92041506	3-350.1
32(l)		92102302	3-532.2
50	CPL	2-2.53	1-572
50(a)		93060201	3-354.2
50(c)		1444	3-354
50(c)		92072001	3-505.6
50(c)		92102303	3-354.1
50(c)	STD	1-8.2	3-351
50(e)		93060201	3-354.2
51(f)	STD	1-8.2	1-580
52(a)		1297	3-355
52(d)(1)		3205	3-356
52(d)(1)		92080401	3-359.1
53(a)		3761	1-199
1926.54		92091701	1-412.97
54(a)		92092101	3-340.3
54(j)		2269	3-360
54(j)		92091701	1-412.97
55	STD	3-4.1A	1-216
55(a)		3205	3-356
55(b)		3701	3-361
57(b)		3205	3-356
58	CPL	2-2.40	3-363
58(Appendix A)		4475	2-364
58(Appendix A)		4476	2-365
58(Appendix A)		4477	2-366

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1926.58(Appendix B)	4475	2-364
58(Appendix B)	4476	2-365
58(Appendix B)	4477	2-366
58(Appendix C)	1753	1-512
58(Appendix C)	4077	1-532
58(Appendix D)	1865	3-377
58(Appendix F)	3699	2-353
58(Appendix G)	1760	3-397
58(Appendix G)	1893	3-217
58(Appendix G)	3346	3-380
58(Appendix G)	3862	3-406
58(a)	1759	2-343
58(a)	93011501	3-436.2
58(a)(2)	1893	3-217
58(a)(3)	1702	3-368
58(a)(3)	1759	2-343
58(a)(3)	2432	3-391
58(a)(3)	4057	3-392
58(b)	1863	3-376
58(b)	1865	3-377
58(b)	1893	3-217
58(b)	2463	2-354
1926.58(b)	3346	3-380
58(b)	3900	2-359
58(b)	4057	3-392
58(b)	92022601	3-436.1
58(c)	3098	3-379
58(e)(1)	1893	3-217
58(e)(2)	1761	2-344
58(e)(2)	3798	3-386
58(e)(3)	1761	2-344
58(e)(4)	3798	3-386
58(e)(6)(i)	3207	3-398
58(e)(6)(i)	3346	3-380
58(e)(6)(i)	3578	3-403
58(e)(6)(i)	3624	3-382
58(e)(6)(i)	3741	3-383
58(e)(6)(i)	3798	3-386
58(e)(6)(i)	3862	3-406
1926.58(e)(6)(i)	4061	3-411
58(e)(6)(i)	4079	3-408
58(e)(6)(ii)	1751	3-415
58(e)(6)(iii)	1866	3-378
58(e)(6)(iv)	1760	3-397
58(e)(6)(iv)	3862	3-406
58(e)(6)(iv)	4061	3-411
58(e)(6)(iv)	93011501	3-436.2
58(f)(1)(i)	4057	3-392
58(f)(1)(i)	4061	3-411
58(f)(1)(iii)	1719	3-372
58(f)(1)(iii)	4177	3-389
58(f)(2)	4177	3-389
58(f)(2)(i)	1747	3-416
58(f)(2)(i)	3036	3-418
58(f)(2)(ii)	1694	3-423
58(f)(2)(ii)	1719	3-372

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Standard Number	Record ID	Volume and Page No.
1926.58(f)(2)(ii)	3036	3-418
58(f)(2)(ii)	3037	3-421
58(f)(2)(iii)	1694	3-423
58(f)(2)(iii)	3037	3-421
58(f)(3)	1747	3-416
58(f)(3)	3376	3-430
58(f)(3)	4177	3-389
58(f)(4)(i)	1747	3-416
58(f)(4)(i)	1767	3-426
58(f)(4)(ii)	1747	3-416
58(f)(5)(i)	1599	2-339
58(f)(5)(ii)	(3)001	2-336
58(f)(5)(ii)	1542	2-337
58(f)(5)(ii)	1599	2-339
58(f)(5)(ii)	1827	2-346
58(f)(5)(ii)	1869	1-591
58(f)(5)(ii)	1896	2-348
1926.58(f)(5)(ii)	2453	2-349
58(f)(5)(ii)	4475	2-364
58(f)(5)(ii)	4476	2-365
58(f)(5)(ii)	4477	2-366
58(g)(1)	93011501	3-436.2
58(g)(1)(i)	3209	3-400
58(g)(1)(i)	3346	3-380
58(g)(1)(i)	3549	3-401
58(g)(1)(i)(A)	3098	3-379
58(g)(1)(i)(A)	3207	3-398
58(g)(1)(i)(A)	3699	2-353
58(g)(1)(i)(D)	3346	3-380
58(g)(1)(i)(D)	3578	3-403
58(g)(1)(i)(E)	1764	2-356
58(g)(2)(ii)	1764	2-356
58(h)(2)	3798	3-386
58(h)(2)(i)	1602	2-340
1926.58(h)(2)(i)	1619	2-342
58(h)(2)(i)	1651	1-445
58(h)(2)(i)	1698	1-447
58(h)(2)(i)	1868	1-459
58(h)(2)(i)	2444	3-427
58(h)(2)(i)	2465	2-351
58(h)(2)(i)	3923	3-394
58(h)(2)(iii)	2444	3-427
58(h)(2)(iii)(A)	1534	1-507
58(h)(3)(iv)	2118	1-480
58(h)(4)(ii)	1753	1-512
58(h)(4)(ii)	1828	3-374
58(h)(4)(ii)	1865	3-377
58(h)(4)(ii)	2465	2-351
58(h)(4)(ii)	3923	3-394
58(h)(4)(ii)	4068	3-429
58(h)(4)(ii)	4077	1-532
1926.58(i)(1)	1893	3-217
58(j)(1)(i)	1750	3-373
58(j)(2)(i)	1750	3-373
58(j)(3)	3362	2-352
58(j)(3)	3856	2-357

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Standard Number		Record ID	Volume and Page No.
1926.58(j)(3)		3900	2-359
58(k)		2947	3-437
58(k)(2)(i)		1761	2-344
58(k)(3)(i)		1863	3-376
58(k)(3)(i)		1866	3-378
58(l)(2)		3798	3-386
58(l)(2)		4127	2-362
58(m)(1)(i)		1865	3-377
58(m)(1)(i)		2463	2-354
58(m)(1)(i)		3376	3-430
58(m)(1)(i)		3816	3-434
58(m)(1)(ii)(A)		1864	2-347
58(m)(1)(ii)(B)		1755	1-167
58(m)(2)(i)		2463	2-354
58(m)(2)(i)(A)		2463	2-354
58(m)(2)(ii)(B)		1864	2-347
58(m)(2)(ii)(C)		3816	3-434
58(m)(2)(ii)(D)		1865	3-377
58(m)(4)(i)(A)		1176	1-9
58(m)(4)(ii)		1723	3-435
58(n)(3)		1176	1-9
58(n)(3)		1343	1-12
58(n)(3)(i)(D)		1343	1-12
58(n)(3)(i)(D)		1400	1-13
58(p)(2)		93011501	3-436.2
58Appendix G		93011501	3-436.2
59	CPL	2-2.38C	3-52
59(b)(1)		93030401	1-537.7
59(c)		2947	3-437
1926.59(c)		93030401	1-537.7
59(d)(1)		2947	3-437
59(d)(1)		3701	3-361
59(d)(1)		93030401	1-537.7
59(e)(1)		3749	3-210
59(e)(2)		1962	3-245
59(e)(2)		2947	3-437
59(g)(1)		2947	3-437
59(g)(8)		3544	3-442
59(g)(9)		3544	3-442
59(h)(1)(i)		3701	3-361
59(h)(2)		D9310023	3-444.1
62		D9310026	3-444.5
62		D9310053	3-444.6
62(c)		D9310053	3-444.6
62(c)(1)		D9310026	3-444.5
62(d)(1)		D9310023	3-444.1
1926.62(d)(2)(v)		D9310026	3-444.5
62(d)(2)(v)(E)		D9310023	3-444.1
62(d)(2)(v)(F)		D9310023	3-444.1
62(d)(2)(v)(F)		D9310053	3-444.6
62(d)(3)(i)		D9310023	3-444.1
62(d)(3)(ii)		D9310023	3-444.1
62(d)(3)(iii)		D9310023	3-444.1
62(d)(3)(iv)		D9310023	3-444.1
62(d)(4)		D9310023	3-444.1
62(d)(5)		D9310023	3-444.1

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Standard Number		Record ID	Volume and Page No.
1926.62(e)(2)(i))		D9310026	3-444.5
62(f)(1)(iii)		D9310053	3-444.6
62(j)(1)(i)		D9310023	3-444.1
62(j)(1)(ii)		D9310023	3-444.1
62(j)(2)(i)(A)		D9310023	3-444.1
62(j)(2)(i)(B)		D9310023	3-444.1
62(l)(1)(i)		D9310053	3-444.6
62(l)(2)		D9310023	3-444.1
62(l)(2)		D9310053	3-444.6
100(a)		1467	3-445
100(a)		91120202	3-445.2
100(a)		92072201	3-445.1
100(b)		92072201	3-445.1
101(b)		92080401	3-359.1
103(b)(2)		1442	3-446
104		1446	3-344
104(a)		91120203	3-453.2
104(b)		D930227a	3-453.1
104(c)		1216	3-449
104(c)		2070	3-450
104(c)		4354	3-452
104(d)		1216	3-449
104(d)		2070	3-450
104(d)		91120203	3-453.2
1926.104(d)		D930227a	3-453.1
104(e)		4354	3-452
104(f)		4354	3-452
105		1446	3-344
105(a)		2007	3-349
105(a)		2106	3-457
105(a)		2194	3-345
105(a)		4354	3-452
105(a)		92020402	3-457.3
105(a)		92052101	3-457.7
105(a)		92072001	3-505.6
105(a)		92091801	3-457.1
105(a)		92111901	3-505.16
105(a)		93052001	3-457.8
105(a)	STD	3-3.1	3-454
106	STD	3-4.1A	1-216
132		D9308045	3-340.1
1926.134		92022601	3-436.1
152(a)		1431	3-458
177		2222	2-24
177	STP	2-1.127	3-338
200(h)(1)		92062402	3-458.1
201(a)(4)		4337	3-459
250(b)(1)	STD	3-6.1	3-460
250(b)(1)	STD	3-6.2	3-461
251(a)		92081901	3-581.7
251(c)(4)		2055	3-462
251(c)(4)(iii)		2055	3-462
251(c)(5)		2055	3-462
251(d)(2)(v)		91120203	3-453.2
302(a)(1)		1206	3-478
302(a)(1)		1772	3-463

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Standard Number		Record ID	Volume and Page No.
1926.302(b)(7)		1318	3-464
302(e)(5)	STD	1-13.2A	2-152
302(e)(7)		1223	3-465
304(f)	STD	1-13.4	3-467
350(a)(4)		92050504	3-581.3
350(a)(9)		92050504	3-581.3
350(a)(9)	STD	3-8.2	3-468
350(f)(5)		1842	3-310
351(c)(5)		93040201	3-468.1
353	STD	3-17.3	3-336
353(c)(2)(i)	STD	3-8.1	3-469
354(c)(1)		1436	3-473
354(c)(1)	STD	3-8.1	3-471
401(j)(2)	STD	3-9.1	3-474
402(a)		1541	3-477
403(a)		91100101	3-477.1
403(a)		92030301	2-200.7
403(a)		92110402	3-479.4
403(a)		93062801	3-479.5
1926.403(b)(1)(i)		92030301	2-200.7
403(e)		1309	3-480
403(g)		92030301	2-200.7
404(a)(2)		92030301	2-200.7
404(b)(1)(i)		1206	3-478
404(b)(1)(i)		1710	3-483
404(b)(1)(i)		92020401	3-479.2
404(b)(1)(i)		92041502	3-479.3
404(b)(1)(i)		92091702	3-479.1
404(b)(1)(i)		92110402	3-479.4
404(b)(1)(ii)		1241	3-479
404(b)(1)(ii)		92041502	3-479.3
404(b)(1)(ii)		93090301	3-479.8
404(b)(1)(iii)		92110402	3-479.4
404(f)(1)		91100101	3-477.1
404(f)(3)		93040201	3-468.1
404(f)(3)(i)		91100101	3-477.1
1926.404(f)(3)(i)		93090301	3-479.8
404(f)(3)(i)(A)		93090301	3-479.8
404(f)(3)(i)(B)		93062801	3-479.5
404(f)(3)(ii)(C)		93062801	3-479.5
404(f)(3)(iii)		91100101	3-477.1
404(f)(3)(iii)		93062801	3-479.5
404(f)(4)		91100101	3-477.1
404(f)(5)		91100101	3-477.1
405(a)(2)		1309	3-480
405(a)(2)(i)		92030301	2-200.7
405(a)(2)(ii)(J)		1557	3-481
405(a)(2)(ii)(J)		92041502	3-479.3
405(g)(1)(i)		1710	3-483
405(g)(2)(iii)		1309	3-480
405(g)(2)(iv)		92030301	2-200.7
405(g)(2)(v)		92030301	2-200.7
417(b)		1541	3-477
432(a)(1)		1541	3-477
449		1772	3-463
449		93062801	3-479.5

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Standard Number		Record ID	Volume and Page No.
1926.451		92072001	3-505.6
451	STD	1-3.3	3-486
451	STD	1-3.3CH-1	3-489
451	STP	2-1.162A	3-511.2
451(a)		1544	3-495
451(a)		92072002	3-591.4
451(a)	STD	3-10.4	3-493
451(a)(1)		92072001	3-505.6
451(a)(10)	STD	3-10.1B	3-490
451(a)(13)		1273	3-497
451(a)(13)		92072001	3-505.6
451(a)(13)		92102703	3-591.3
451(a)(18)	STD	3-10.6	3-494
451(a)(4)		2194	3-345
1926.451(a)(4)		2266	3-496
451(a)(4)		92030501	3-505.15
451(a)(4)		92072001	3-505.6
451(a)(4)		92080702	3-505.8
451(a)(5)		1447	3-499
451(a)(5)		92030501	3-505.15
451(a)(5)	STD	3-10.3	3-492
451(a)(6)		92030501	3-505.15
451(a)(7)		92050502	3-505.1
451(a)(7)		92050503	3-505.2
451(a)(7)		92091502	3-505.9
451(c)		1790	3-498
451(c)(12)		1707	3-500
451(c)(13)		1447	3-499
451(d)(10)		1447	3-499
451(d)(7)		1707	3-500
451(e)(5)		92072001	3-505.6
1926.451(e)(8)		92062403	3-505.3
451(f)		92072001	3-505.6
451(i)(2)		1805	3-502
451(i)(8)		1781	3-503
451(i)(8)		92072002	3-591.4
451(i)(8)	STD	3-10.2	3-491
451(l)		91120201	3-505.11
451(l)		92012801	3-505.14
451(s)(5)		2075	3-504
451(s)(5)		92072004	3-505.5
451(s)(5)		92102802	3-505.10
451(u)(3)		92072001	3-505.6
451(u)(3)		92111901	3-505.16
451(y)(1)		1636	1-86
451(y)(11)		92072004	3-505.5
451(y)(4)(ii)		1636	1-86
500	STP	2-1.162A	3-511.2
1926.500(b)(8)		1449	3-507
500(d)(1)		1446	3-344
500(d)(1)		2068	3-569
500(d)(1)		2469	3-508
500(f)(1)(vi)		1229	3-511
500(g)(1)(iii)	STD	3-11.1	3-506
500(g)(1)(iii)	STP	2.20	3-511.1
502(a)		1449	3-507

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Standard Number		Record ID	Volume and Page No.
1926.550		2179	2-47
550		D9308011	2-58.9
550(a)		2212	3-526
550(a)		93041501	2-58.6
550(a)(1)		2057	3-520
550(a)(1)		92041505	3-531.6
550(a)(1)		D9308033	3-531.3
550(a)(14)(i)		1422	3-522
550(a)(15)		1780	3-526
550(a)(15)		4243	3-525
550(a)(15)		92072102	3-531.1
550(a)(15)(i)		2321	3-523
550(a)(15)(i)	STD	3-12.1A	3-515
550(a)(15)(ii)		2321	3-523
550(a)(15)(iii)		2321	3-523
550(a)(16)		92041505	3-531.6
550(a)(2)		91110501	2-58.2
550(a)(5)		93080501	3-531.7
550(a)(6)		92041504	3-531.5
550(a)(6)		93080501	3-531.7
550(a)(9)		1319	3-521
550(a)(9)	STD	3-12.2	3-516
550(b)(2)		2060	2-58
550(b)(2)		2132	3-529
550(b)(2)		91112201	3-531.4
550(b)(2)	STD	1-11.2B	3-512
1926.550(b)(2)	STP	2-1.143	3-518
550(d)(4)		2132	3-529
550(d)(4)	STD	3-12.4	3-517
550(e)		2132	3-529
550(f)(1)(ii)		91110501	2-58.2
550(g)		92111001	2-58.3
550(g)		93041501	2-58.6
550(g)	STP	2-1.150	3-519
550(g)(2)		1809	3-530
550(g)(2)		3082	3-531
550(g)(3)(i)(C)		91112201	3-531.4
550(g)(3)(ii)(C)		91112201	3-531.4
550(g)(3)(ii)(C)		D9308012	3-531.2
550(g)(4)		91120201	3-505.11
550(g)(4)		92012801	3-505.14
550(g)(4)(iv)(B)		D9308011	2-58.9
552(b)		92102704	3-532.1
1926.552(b)(2)		92102704	3-532.1
552(b)(3)		92102704	3-532.1
552(b)(5)		92102704	3-532.1
552(b)(5)(ii)		92102704	3-532.1
552(c)		1448	3-532
552(c)(15)	STP	2-1.143	3-518
556	STD	1-3.2	4-158
556(a)(1)		2069	1-116
556(a)(1)		92102302	3-532.2
556(a)(1)(v)		2069	1-116
556(b)(2)		92102302	3-532.2
556(b)(2)(ii)		92102302	3-532.2
556(b)(2)(ix)		92111001	2-58.3

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Standard Number		Record ID	Volume and Page No.
1926.556(b)(2)(ix)		93041501	2-58.6
556(b)(2)(v)		92072001	3-505.6
601(a)		1412	3-533
601(a)		1708	3-534
601(a)		91100102	3-535.1
601(b)(11)		91100102	3-535.1
601(b)(4)		1708	3-534
601(b)(4)(i)		4030	3-535
601(b)(4)(ii)		4030	3-535
601(b)(8)		1412	3-533
602(a)(4)		1787	3-536
602(a)(6)		92072401	3-591.1
602(a)(8)		1787	3-536
602(b)		92072401	3-591.1
603	STD	3-13.1	3-537
603(a)(8)	STD	3-13.1	3-537
603(b)		1533	2-57
603(c)(1)		1533	2-57
604(a)(2)	STD	1-15.5	3-538
605(a)		2129	3-315
605(a)(1)	STD	3-13.2	3-539
1926.650	CPL	2.87	3-545
650(Appendix A(d)(2)(iii))		92032301	3-553.5
650(Appendix A)(d)(2)(ii)		92061501	3-340.1
650(b)		92041506	3-350.1
650(b)		92052102	3-557.3
650(b)		92102702	3-553.1
651(c)(1)		92032301	3-553.5
651(d)		4337	3-459
651(g)		92061501	3-340.1
651(g)(1)		92032301	3-553.5
651(g)(2)(i)		92032301	3-553.5
651(g)(2)(ii)		91120201	3-505.11
651(g)(2)(ii)		92012801	3-505.14
651(h)(1)		92032301	3-553.5
651(k)		91010901	3-553.3
651(k)(1)		91010901	3-553.3
651(k)(1)		92080501	3-553.2
1926.652	CPL	2.69	3-541
652	STP	2-1.157	3-554
652(Appendix B)		4367	3-557
652(Appendix C, Table C-1.3)		92050501	3-557.1
652(Appendix D (g)(7))		92041507	3-557.6
652(Appendix D, Table D-1.4)		92050501	3-557.1
652(a)(2)		92032301	3-553.5
652(b)(1)		4367	3-557
652(b)(1)		91010901	3-553.3
652(b)(1)(i)		92031001	3-557.5
652(b)(1)(ii)		92031001	3-557.5
652(b)(4)(i)		91110701	3-557.4
652(c)(1)		1720	3-556
652(c)(1)		91010901	3-553.3
652(c)(1)		92041507	3-557.6
652(c)(1)		92050501	3-557.1
652(c)(1)		93021901	3-557.7
652(c)(2)		91010901	3-553.3

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1926.652(c)(2)		92032301	3-553.5
652(c)(2)		92050501	3-557.1
652(c)(2)		92052101	3-457.7
652(c)(2)		92052102	3-557.3
652(c)(2)		92102702	3-553.1
652(c)(3)		91010901	3-553.3
652(c)(3)		92041507	3-557.6
652(c)(3)		92052101	3-457.7
652(c)(3)		93021901	3-557.7
652(c)(3)(iii)		92032301	3-553.5
652(c)(3)(iii)		92102702	3-553.1
652(c)(4)		91010901	3-553.3
652(c)(4)		93021901	3-557.7
652(c)(4)(ii)(B)		92102702	3-553.1
652(d)		92050501	3-557.1
652(d)(3)		92032301	3-553.5
1926.652(g)(1)(i)		91110701	3-557.4
652(g)(1)(iv)		91110701	3-557.4
652(i)(2)(iv)		92032301	3-553.5
652(k)		92032301	3-553.5
700	STD	3-15.1	3-558
700	STD	3-15.2	3-559
700(Subpart Q)	STP	2-1.149	4-159
700(a)	STD	1-12.13	2-114
702(c)		1776	3-560
705	STD	3-15.3	3-561
705	STP	2-1.161	4-161
706(a)		1820	3-564
706(a)(2)		1820	3-564
706(a)(4)		1820	3-564
706(a)(5)		1820	3-564
706(b)		1820	3-564
750(b)(1)(ii)		1450	3-568
1926.750(b)(1)(ii)		92020402	3-457.3
750(b)(1)(iii)		1229	3-511
750(b)(1)(iii)		2068	3-569
750(b)(1)(iii)		2469	3-508
750(b)(2)(i)		2007	3-349
750(b)(2)(i)		92020402	3-457.3
750(b)(2)(i)		92091801	3-457.1
750(b)(2)(i)		93052001	3-457.8
751(c)(2)		1789	3-570
800	STD	3-17.2	3-578
800	STP	2-1.155	3-581.1
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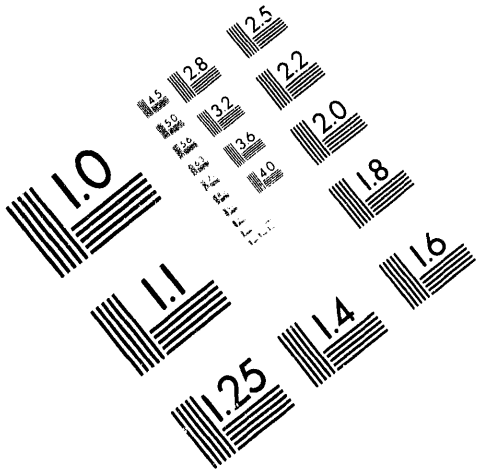

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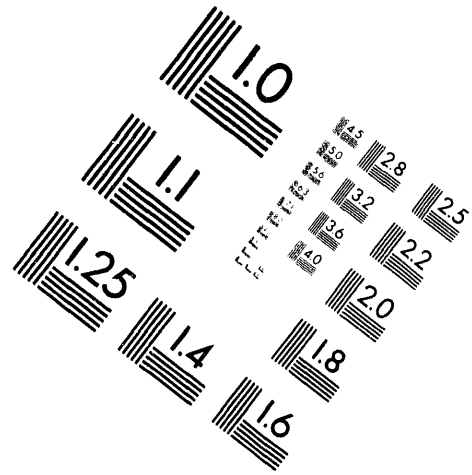

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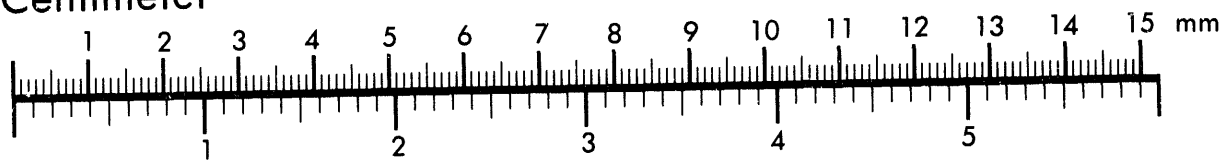

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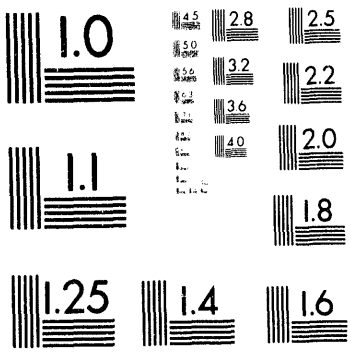

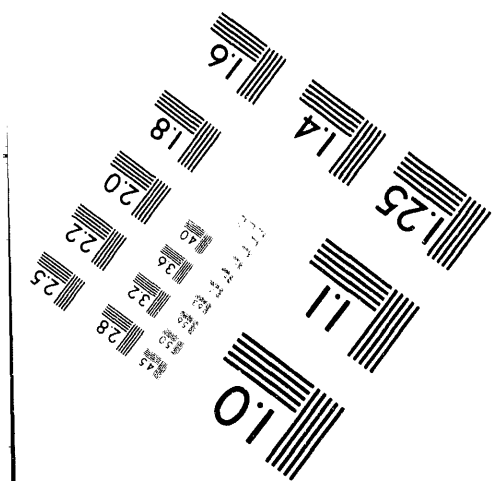

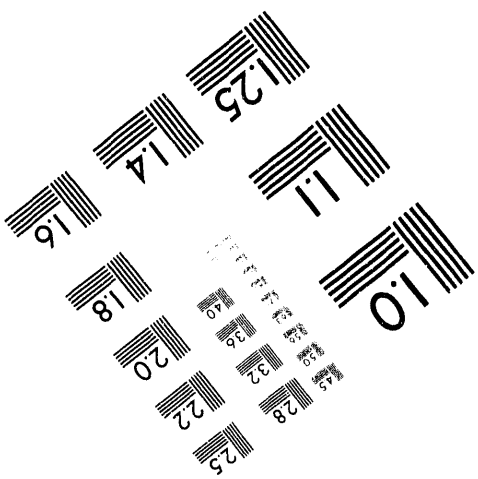

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red bags			
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substitutes for biohazard labeling	1910.1030	92082101	2-564.107
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	1910.1030	92102201	2-564.115
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	1910.1030	92102201	2-564.115
	1910.1030	92102202	2-564.158
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non-health care facilities	1910.1030	92062501	2-564.80
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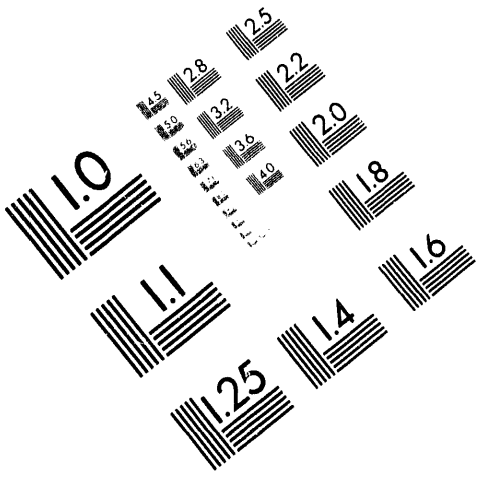

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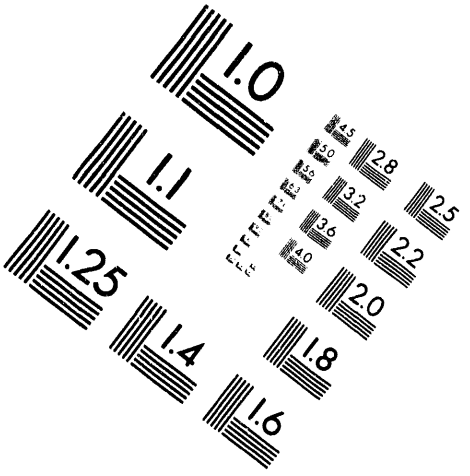

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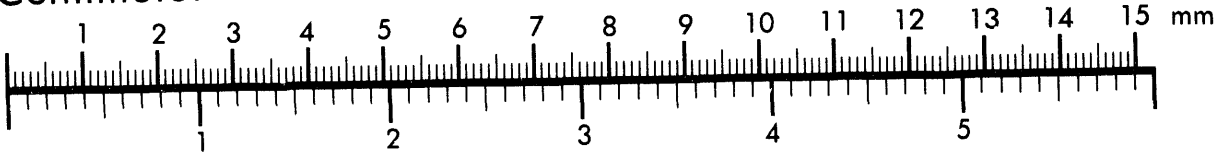

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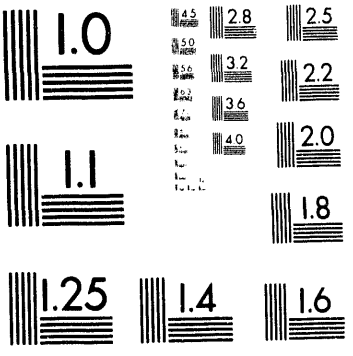

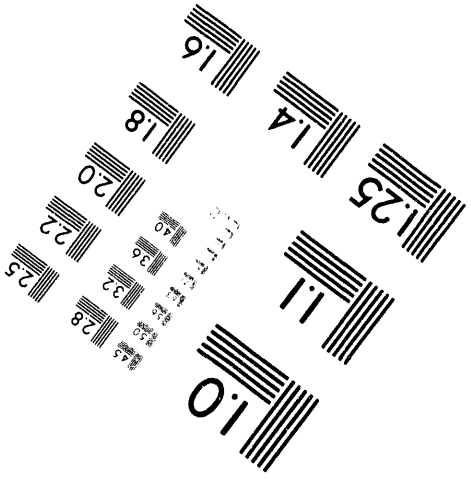

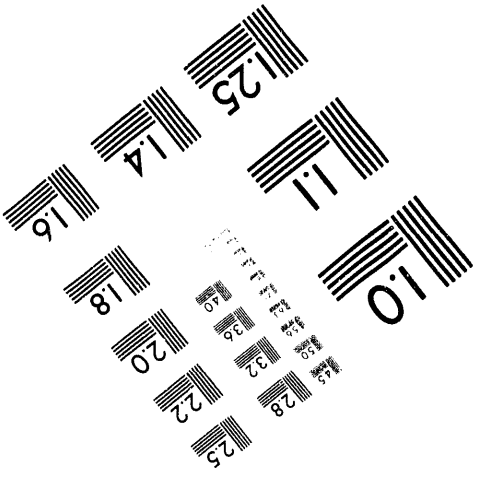

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Agriculture Occupational Safety & Health Standards-1928

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1928.57 Guarding of farm field equipment, farmstead equipment, and cotton gins

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Sub-Part I-General Environmental Controls

1928.110 Field sanitation

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