DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Parts 1910, 1915, 1917, 1918, 1926, and 1928

RIN 1218–AB02

Hazard Communication

AGENCY: Occupational Safety and Health Administration (OSHA); Labor.

ACTION: Final rule.

SUMMARY: The HCS requires employers to establish hazard communication programs to transmit information on the hazards of chemicals to their employees by means of labels on containers, material safety data sheets, and training programs. Implementation of these hazard communication programs will ensure all employees have the ''right-to-know'' the hazards and identities of the chemicals they work with, and will reduce the incidence of chemically-related occupational illnesses and injuries.

This modified final rule includes a number of minor changes and technical amendments to further clarify the requirements, and thereby help ensure full compliance and achieve protection for employees. In particular, the rule adds and clarifies certain exemptions from labeling and other requirements; modifies and clarifies aspects of the written hazard communication program and labeling requirements; clarifies and slightly modifies the duties of distributors, manufacturers, and importers to provide material safety data sheets (MSDSs) to employees; and clarifies certain provisions regarding MSDSs.

EFFECTIVE DATES: The amendments in this document will be effective on March 11, 1994.

FOR FURTHER INFORMATION CONTACT: Mr. James F. Foster, Office of Information and Consumer Affairs, Occupational Safety and Health Administration, 200 Constitution Avenue, NW., room N3647, Washington, DC 20210; telephone (202) 219–8151.

To aid in efforts to comply with the HCS, a single copy of the following documents may be obtained without charge from OSHA's Publications Office, room N3101 at the above address, (202) 219–4667: the Hazard Communication Standard (a **Federal Register** reprint of today's publication); OSHA 3084, Chemical Hazard Communication, a booklet describing the requirements of the rule; OSHA 3117, Informacion Sobre Los Riesgos De Los Productos Quimicos, a Spanish translation of OSHA 3084; OSHA 3111, Hazard Communication Guidelines for Compliance, a booklet which reprints Appendix E of the standard to further help employers comply with the rule; and OSHA 3116, Information Sobre Riegos Normas De Cumplimiento, a Spanish translation of OSHA 3111.

OSHA 3104, Hazard Communication—A Compliance Kit (a step-by-step guide to compliance with the standard) is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 783–3238; GPO Order No. 929–022–00000–9; $18—domestic; $22.50—foreign.

SUPPLEMENTARY INFORMATION: References to the rulemaking record are made in the text of this preamble. The Hazard Communication Standard docket, No. H–022, contains eight sub-dockets—H–022A, H–022B, H–022C, H–022D, H–022E, H–022F, H–022G, and H–022H. All of these docket files are part of the rulemaking record. However, in this document, no specific references are made to either Docket H–022C or H–022E (these files deal exclusively with the issue of trade secrets), or H–022F, H–022G, and H–022H. The following abbreviations have been used for citations to the other record files:

H–022, Ex.: Exhibit numbers in Docket H–022, which includes H–022A and H–022B, for exhibits collected for the original 1983 HCS for manufacturing.

Ex.: Exhibit numbers in H–022D for exhibits collected since the 1985 Court remand related to the expansion of the scope of industries covered. This docket includes the comments received in response to the August 8, 1988 proposal.

Tr.: Public hearing transcript page numbers. The hearing transcript pages from the December 1988 hearing are not numbered consecutively, *i.e.,* each day begins again with page 1. Transcript references will thus include a reference to the day, and the page number for that day's testimony. The days are numbered as follows: December 6 is Day 1; December 7 is Day 2; December 8 is Day 3; December 9 is Day 4; December 12 is Day 5; December 13 is Day 6; and December 14 is Day 7. As an example, a reference to testimony which appears on page 65 of the transcript for December 8 will be indicated as ''Tr. 3–65.'' Transcript references to hearings held between June 15 and July 31, 1982, are consecutively numbered, and will not have a prefix number identifying the day.

I. Background

A. Review of the Need for the Standard

The HCS was promulgated to provide workers with the right to know the hazards and identities of the chemicals they are exposed to while working, as well as the measures they can take to protect themselves. OSHA has estimated that there are over 32 million workers exposed to hazardous chemicals in over 3.5 million workplaces (48 FR 53282, 53323; 52 FR 31871). According to the National Institute for Occupational Safety and Health (NIOSH), there are as many as 575,000 hazardous chemical products in these workplaces (48 FR 53323). Based on the growth rate of the chemical industry with regard to new products, this number may now be as high as 650,000. Chemical exposures occur in every type of industry (52 FR 31858). (See also Exs. 4–1 and 4–2.) In fact, workers typically experience multiple exposures to numerous industrial chemicals at one point of time or over a long period of employment. 48 FR 53323.

Besides having what OSHA considers to be an inherent right to know about hazardous chemicals in their workplaces, exposed employees have a need to know this information as they are at significant risk of experiencing adverse health or physical effects in the absence of such knowledge. Chemicals pose a myriad of hazards to exposed workers, from mild health effects, such as irritation, to death. Some chemicals cause or contribute to chronic diseases, such as heart disease, kidney disease, sterility, or cancer. Many chemicals cause acute injuries or illnesses such as rashes, burns, and poisoning. Numerous chemicals pose physical hazards to workers by contributing to accidents like fires and explosions.

During the HCS rulemaking, data collected about chemical illness and injury rates in manufacturing sectors showed that some 40–50,000 manufacturing workers experienced chemical source illnesses a year, and an average 10,000 worker compensation claims were filed annually in connection with chemical illness or injury in manufacturing (48 FR 53285). Employees in non-manufacturing industries were estimated to experience acute chemical illness and injury at the rate of 13,671 injuries, 38,248 illnesses, and 102 fatalities per year. 52 FR 31868. The chronic disease rate was 17,153 chronic illnesses, 25,388 cancer cases, and 12,890 cancer deaths per year. *Id.* (Compare with, Ex. 4–77 (NIOSH data indicating 136,212 work-related chemical injuries treated in emergency rooms in 1986)).

OSHA believes that the reported data understate the extent of the health and safety problems caused by chemicals in the workplace. Lack of knowledge about health effects associated with chemical exposures contributes to the chronic underreporting of occupational illnesses (Exs. 4–44; 41). As the effects caused are diseases or physical manifestations that may also occur in workers as a result of non-chemical or non-occupational factors, it is often difficult to identify such ailments as being caused by occupational exposures. Misdiagnosis is a problem and often symptoms are treated without realizing that the cause is an occupational chemical exposure. See, e.g., 53 FR 25973 (Ex. 4–178).

Worker turnover in many industries also increases the likelihood that the link between a workplace chemical exposure and subsequent illness will be overlooked and will not be reported. This is particularly true for long-term health effects which develop over time, or after repeated exposures. Many chronic diseases are characterized by long latency periods of 20–30 years or longer.

In addition, health effects of some chemicals may contribute to the occurrence of injuries that are reported but are not causatively linked to chemical exposures. For example, central nervous system depression due to solvent exposure may cause a painter to become dizzy and fall off a ladder. The subsequent injury may be reported, but the solvent exposure is not identified as the cause. (See Exs. 67 for studies on neurobehavioral changes in painters due to solvent exposures; 4–161 for case of injury to cosmetologist resulting from solvent exposure causing dizziness, loss of balance, and a fall.)

B. Overview of Standard

The purpose of the HCS is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. In broad outline, the HCS achieves its purpose by an integrated three-pronged system. First, chemical manufacturers and importers must review available scientific evidence concerning the physical and health hazards of the chemicals they produce or import to determine if they are hazardous. (Paragraph (d)). Second, for every chemical found to be hazardous, the chemical manufacturer or importer must develop comprehensive material safety data sheets (MSDSs) and warning labels for containers and send both downstream along with the chemicals. (Paragraphs (f), (g)). Third, all employers must develop a written hazard communication program and provide information and training to employees about the hazardous chemicals in their workplace. (Paragraphs (e), (h)).

The three information components in this system—labels, material safety data sheets, and worker training—are all essential to the effective functioning of the program. The MSDSs provide comprehensive technical information, and serve as a reference document for exposed workers as well as health professionals providing services to those workers. The labels provide a brief synopsis of the hazards of the chemicals at the site where the chemical is used in the work area. Training ensures that workers understand the information on both MSDSs and labels, know how to access this information when needed, and are aware of the proper protective procedures to follow. Each component effectuates the others. See *General Carbon Co.* v. *OSHRC,* 860 F.2d 479, 481 (DC Cir. 1988).

The provision of information under the HCS about these effects and protective measures will reduce the incidence of chemical source illnesses and injuries in the workplace. 48 FR 53281–83. An effective hazard communication program will accomplish this purpose through modifying the behavior of both employers and employees. Employers, many of whom have not been aware of the potential hazards of the chemicals they purchase to use in their workplaces, will be able to use the information provided under the HCS to design better protective programs. Complete information about chemicals may allow an employer to choose a less hazardous product, thus preventing dangerous exposures from occurring. Exs. 4–194, 71–40. Accurate information is also needed to properly design engineering controls, select appropriate protective clothing, and choose an effective respirator for exposed employees. Ex. 71–40. Improved understanding of chemical hazards by supervisory personnel results in safer day-to-day handling of hazardous substances, and proper storage and clean-up. See *e.g.,* Exs. 4–61, 4–75, 71–40.

Workers provided the necessary hazard information will more fully participate in, and support, the protective measures instituted in their workplaces. The presence of labels and material safety data sheets in the workplace will provide each worker with the hazards of the chemicals, as well as the means to protect themselves. The training of workers will teach them how to use the available information effectively. Properly trained workers will know how to read and use labels and material safety data sheets, will know what protection is required to work safely with the chemicals in the workplace and will use it, and will be able to determine what actions are necessary if an emergency occurs. (E.g., Exs. 4–75, 4–174.) Information on chronic effects of exposure to hazardous chemicals will help workers recognize such symptoms and seek early treatment of chronic disease.

The information provided under hazard communication will also enable health and safety professionals to provide better services to exposed employees. (E.g., Exs. 4–153, 71–37.) Medical surveillance, exposure monitoring, and other such services will be enhanced by the ready availability of health and safety information.

As OSHA has noted in Appendix E of the rule: ''For any safety and health program, success depends on commitment at every level of the organization. This is particularly true for hazard communication, where success requires a change in behavior. This will only occur if employers understand the program, and are committed to its success, and if employees are motivated by the people presenting the information to them.''

It is in these ways that the HCS addresses the significant risks posed to workers handling hazardous chemicals and not knowing their hazards or the proper methods of handling and using them. This rulemaking is intended to promulgate minor changes and technical amendments to the existing HCS to enhance its effectiveness.

C. History of the Rulemaking

The development of OSHA's Hazard Communication Standard (HCS) was initiated in 1974. The process has been lengthy and is discussed in detail in the preambles to both the original and revised final rules (see 48 FR 53280–81 and 52 FR 31852–54), and in the August 1988 NPRM (53 FR 29822–25). This discussion will focus on the sequence of events which has occurred since the original final rule was published in the **Federal Register** on November 25, 1983, and in particular, those which have occurred since the NPRM was published.

The original rule, which was promulgated on November 25, 1983 (48 FR 53280), covered employees in the manufacturing sector of industry. That rule was modified on August 24, 1987 (52 FR 31852) to expand the coverage to all industries where employees are exposed to hazardous chemicals. Complete implementation of the standard's requirements in the non-

manufacturing sector was subsequently delayed by various court and administrative actions. However, the August 24, 1987, rule is now fully effective and has been so since January 24, 1989, and is being enforced in all industries. (See Notice of Enforcement, 54 FR 6886, Feb. 15, 1989).

Petitions for judicial review of the original 1983 rule covering manufacturing were filed in the U.S. Court of Appeals for the Third Circuit (hereinafter referred to as ''the Court'' or ''the Third Circuit'') by the United Steelworkers of America, AFL–CIO–CLC, and by Public Citizen, Inc., representing itself and a number of labor groups. Motions to intervene in these cases were received from the Chemical Manufacturers Association, the American Petroleum Institute, the National Paint and Coatings Association, and the States of New York, Connecticut, and New Jersey. In addition, petitions for review of the standard were filed by the State of Massachusetts in the First Circuit; the State of New York in the Second Circuit; the State of Illinois in the Seventh Circuit; the Flavor and Extract Manufacturers' Association in the Fourth Circuit; and the Fragrance Materials Association in the District of Columbia Circuit. These cases were subsequently transferred to the Third Circuit and consolidated into one proceeding. The cases brought by the Flavor and Extract Manufacturers' Association and the Fragrance Materials Association were withdrawn prior to filing briefs.

The Court issued its initial decision on the challenges to the rule on May 24, 1985 *United Steelworkers of America* v. *Auchter*, 763 F.2d 728 (3d Cir. 1985)(Ex. 4–21.) The standard was upheld in most respects, but three issues were remanded to the Agency for reconsideration. The decision was not appealed.

First, the Court concluded that the definition of trade secrets incorporated by OSHA included chemical identity information that was readily discoverable through reverse engineering and, therefore, was ''broader than the protection afforded trade secrets by state law.'' The Court directed the Secretary of Labor to reconsider a trade secret definition which would not include chemical identity information that is readily discoverable through reverse engineering. Secondly, the Court held the trade secret access rule in the standard invalid insofar as it limited access to health professionals, but found the access rule otherwise valid. The Secretary was directed to adopt a rule permitting access by employees and their collective bargaining representatives to trade secret chemical identities. OSHA complied with the Court orders regarding the two trade secret issues in a separate rule, published in final form on September 30, 1986 (51 FR 34590). The revised trade secret provisions were incorporated into the text of the final rule published on August 24, 1987.

The third issue remanded to OSHA involved the scope of industries covered by the standard. The original HCS applied to employers and employees in the manufacturing sector. The Court directed the Secretary of Labor to reconsider the standard's application to employees in other industry sectors, and ''to order its application in those sectors unless he can state reasons why such application would not be feasible.'' 763 F.2d at 739, 743.

OSHA subsequently published an advance notice of proposed rulemaking (ANPR) to collect comments and information on the expansion of the scope to cover these additional sectors (50 FR 48795; November 27, 1985). In particular, the Agency sought information on the extent employers in non-manufacturing industries had already implemented various aspects of a hazard communication program. In addition, OSHA wanted to obtain data regarding the applicability of the provisions as written in the original rule to these other sectors. A total of 226 responses were received. (See Ex. 2.) OSHA also commissioned a study of the economic impact of extending the HCS to the fifty major non-manufacturing industry groups within its jurisdiction. (See Exs. 4–1 and 4–2.) Based on this newly acquired evidence, as well as the previous rulemaking record, OSHA was in the process of drafting a proposed rule.

On January 27, 1987, however, the United Steelworkers of America, AFL-CIO-CLC and Public Citizen, Inc., petitioners in the 1985 challenge, filed a Motion For An Order Enforcing the Court's Judgment and Holding Respondent in Civil Contempt. Petitioners claimed that the Court's 1985 order had not authorized OSHA to embark on further fact gathering, and that OSHA should have made a feasibility determination based upon the 1985 rulemaking record. Petitioners also argued that even if further fact gathering had been allowed by the Court's order, OSHA's pace was unduly slow.

In response, OSHA noted that the Court's 1985 order did not specify that OSHA should act on the then-existing record. OSHA believed that seeking further evidence on feasibility in non-manufacturing was appropriate in light of its statutory obligation to issue rules that are well grounded in a factual record. OSHA also asserted that, consistent with Supreme Court precedent, the Agency should be permitted to exercise its discretion in determining the appropriate rulemaking procedures for complying with the Court's remand order. Lastly, the Agency argued that its schedule to complete the rulemaking was reasonable and did not constitute undue delay.

On May 29, 1987, the Court issued a decision holding that the Court's 1985 remand order required consideration of the feasibility of an expanded standard without further rulemaking. *United Steelworkers of America, AFL–CIO–CLC* v. *Pendergrass*, 819 F.2d 1263 (3d Cir. 1987) (Ex. 4–20.) The Court declared that adequate notice had been provided to non-manufacturers during the original rulemaking that they might be covered by the HCS, *id.* at 1265–1266, 1269, that the answers to the remaining questions OSHA may have had regarding feasibility were ''self-evident'' or ''readily ascertainable'' from the original record, *id.* at 1268–69, and that further fact finding was ''unnecessary'', *id.* at 1268. The Court ordered the Agency to issue, within 60 days of its order, ''a hazard communication standard applicable to all workers covered by the OSHA Act, including those which have not been covered in the hazard communication standard as presently written, or a statement of reasons why, on the basis of the present administrative record, a hazard communication standard is not feasible.'' *Id.* at 1270.

OSHA subsequently re-evaluated the evidence in the record and determined that a modified final rule covering all employers subject to the Act (*i.e.*, both manufacturing and nonmanufacturing) was both necessary (the Agency had determined in 1983 that all employees exposed to hazardous chemicals without having adequate information about them were at significant risk of experiencing adverse effects) and feasible (both technologically and economically). The Agency therefore issued the revised rule on Hazard Communication which was published in the **Federal Register** on August 24, 1987 (52 FR 31852).

The only modifications OSHA made to the original rule in the 1987 revision were those that were related to expansion of the scope. Publication of a final rule precluded any actions other than those specifically required by the expansion, particularly since the Court determined that the record it reviewed (exhibits collected through November

1983) was a sufficient basis for the final rule. Thus evidence collected subsequent to that time was merely cited as additional substantiation for the expansion.

The revised final rule expanded the scope of industries covered from just the manufacturing sector to all industries where employees are exposed to hazardous chemicals. As OSHA stated at that time, the Agency has evidence to indicate that there is chemical exposure in every type of industry, lack of knowledge about those hazardous chemicals puts employees at a significant risk of experiencing material impairment of health, and thus employees in all industries must have protection under the rule. (See 52 FR 31858.)

Although the standard was issued as a final rule, OSHA invited interested parties to submit information, data or evidence regarding the feasibility or practicality of the provisions as written when applied to the non-manufacturing sector, as well as any recommendations for further modification. A 60-day period was established for such comments, and it ended on October 23, 1987. A total of 137 comments were received (40 of them were received after the deadline), and entered into Docket H–022D (Ex. 5). A variety of opinions was expressed in the comments regarding a number of issues; however, most of the comments did not contain data or evidence concerning either feasibility or practicality. Many of the comments were questions or requests for clarification of the provisions.

In addition to the comments submitted to OSHA, the Office of Management and Budget (OMB) convened a public meeting under the Paperwork Reduction Act (44 U.S.C. 35) to address the information collection requirements of the expanded rule. The transcript of the OMB public meeting (which was held on October 16, 1987) is entered in the docket as Ex. 5–76, and other relevant documents (*e.g.*, copies of statements, etc.) are entered in Exhibit 6. (In addition, the transcript of an April 2, 1987, public meeting on the information collection requirements for the manufacturing sector is Ex. 4–3.) The majority of the participants in OMB's October 16 meeting submitted written comments to OSHA as well, so there is considerable duplication in Exhibit 6 of opinions that had already been expressed by the same parties in other parts of the rulemaking record.

In a letter sent to the Department of Labor on October 28, 1987, and subsequently published by OSHA in the **Federal Register** on December 4, 1987 (52 FR 46075) (Ex. 4–67), OMB, under the authority of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), disapproved certain information collection requirements in the expanded scope rule, as of the rule's effective date (May 23, 1988). These were based upon the record of the October 16 public meeting and the previous meeting on April 2, 1987 regarding the information collection requirements for the manufacturing sector, as well as OSHA's preamble to its August 24 rule and its justification submitted formally under the Paperwork Reduction Act. The October 28 letter stated that OMB disapproved: (1) The requirement that material safety data sheets be provided on multi-employer worksites; (2) coverage of any consumer product that falls within the ''consumer products'' exemption included in Section 311(e)(3) of the Superfund Amendments and Reauthorization Act of 1986; and (3) coverage of any drugs regulated by the Food and Drug Administration in the non-manufacturing sector. In addition, OMB determined that OSHA should reopen the rulemaking on the HCS to consider alternatives to the definition of ''article'' which was included in both the original and revised final rules. Lastly, OMB conditioned paperwork approval upon OSHA's consulting with the U.S. Small Business Administration and the Department of Commerce in order to develop a plan for a Federal administrative effort that will provide assistance to the regulated industries to alleviate paperwork burdens and costs. For a complete description of OMB's rationale for these determinations, see the **Federal Register** notice of December 4, 1987 (52 FR 46075).

On April 13, 1988, OMB extended its approval of all information collection requirements in the HCS through April 1991, except that OMB continued to disapprove the three provisions previously disapproved. 53 FR 15033. OMB's approval of the existing definition of ''article'' was limited to the clarification included in a January 14, 1988, letter from Assistant Secretary for Occupational Safety and Health John Pendergrass to OMB, which stated that ''absent evidence that releases of such very small quantities could present a health hazard to employees, the article exception to the rule's requirements would apply.'' In response to commenters who requested that OMB not extend approval to any requirements in the non-manufacturing sector, OMB also stated:

> The concerns of these commenters are largely based on the possibility that the standard and OMB's decision under the PRA will change dramatically as a result of the rulemaking. Although change is always possible, any such change would be fully considered during the rulemaking process. Of course, in order for OMB to grant PRA approvals, any changes must offer sufficient practical utility to justify any incremental paperwork burden they impose, including the burden of revising already-developed written programs. Moreover, as stated above, we are continuing to disapprove the previously-disapproved provisions; the rulemaking should of course conform the rule to these disapprovals.

On August 8, 1988, OSHA published a notice of proposed rulemaking (NPRM) to modify its Hazard Communication Standard (HCS) (53 FR 29822).

In the NPRM, OSHA reopened the rule on all of the issues raised by OMB in its letter in order to have an opportunity to fully discuss the complete current record on each item, as well as to collect additional data from the public.

The initial deadline for receipt of comments on the NPRM was October 7, 1988. This date was later extended to October 28, 1988. OSHA received 167 comments.

An informal public hearing was convened in Washington, DC on December 6, 1988, and was adjourned on December 14, 1988. Over 1300 pages of oral testimony were received. Sixty days were provided for post-hearing submissions of new information by hearing participants (ending February 13, 1989), and an additional thirty days were allowed for submission of summary briefs. A total of thirty-four post-hearing exhibits have been entered into the record.

Administrative Law Judge George Fath certified and closed the hearing record on November 9, 1990.

OSHA published two requests for comments and information subsequent to the 1988 NPRM. On January 22, 1990 (55 FR 2166), the Agency solicited public input related to international harmonization of chemical safety and health information, and a proposed convention and recommendation of the International Labor Organization (ILO). OSHA received 52 comments in response to this notice which were used by United States' representatives to prepare for participation in the ILO meetings on these documents.

On May 17, 1990 (55 FR 20580), OSHA published a request for comments on improving the effectiveness of information generated in accordance with the HCS, and subsequently disseminated on labels and MSDSs. Nearly 600 comments were received during the 90 day comment period. Many commenters supported standardization of the format or order of information on the MSDSs, and of the

presentation of information on labels. The Agency has decided that administrative or regulatory changes to be made in response to these comments will be done separately from this final rule.

D. Court Challenges to the Revised Final Rule

The revised final rule was challenged in the U.S. Court of Appeals by the Associated Builders and Contractors, National Grain and Feed Association, Associated General Contractors of Virginia, Associated General Contractors of America, and United Technologies Corporation. A number of interested parties intervened in the cases as well. The challenges generally involved the appropriateness of OSHA's publishing a final rule in response to the Third Circuit's order.

Although these cases were originally consolidated in the U.S. Court of Appeals for the District of Columbia Circuit, they were transferred to the U.S. Court of Appeals for the Third Circuit on May 20, 1988. The cases were transferred to the Third Circuit because the ''revised [HCS] was promulgated in response to orders by the Third Circuit * * * and petitioners have raised issues similar to those already considered by that court.''

On June 24, 1988, the Third Circuit granted a stay of the standard as it applied to the construction industry (29 CFR 1926.59) pending the outcome of the litigation challenging the rule. OSHA published a notice in the **Federal Register** on July 22, 1988 (53 FR 27679) to provide the public further information regarding the applicability of the stay to construction employers and enforcement of the rule in the other industries

After considering the merits of the challenges to the standard which were filed by employer representatives, the U.S. Court of Appeals for the Third Circuit issued a decision on November 25, 1988 that denied the petitions for review. The Court stated: ''None of the substantive or procedural challenges to the application of the hazard communication standard to the construction or grain processing and storage industries have merit. The petitions for review of ABC (Associated Builders and Contractors, Inc.), AGC (The Associated General Contractors), NGFA (The National Grain and Feed Association, Inc.) and UTC (United Technologies Corporation) will therefore be denied. The stay of those standards granted by a panel of this court on June 24, 1988, shall be vacated.'' *Associated Builders and Contractors, Inc.* v. *Brock*, 862 F.2d 63, 69 (3d Cir. 1988) (Ex. 15). Further requests from the AGC and the ABC for a continuation of the stay were denied by the Third Circuit and by the United States Supreme Court (Nos. 88–1070; 88–1075). The Supreme Court also declined to review the Third Circuit's decision (November 29, 1988). The Third Circuit's ruling became fully effective on January 30, 1989. The standard, therefore, is effective in all industries. 54 FR 6886.

E. Litigation Involving Provisions Disapproved With Regard to Information Collection Requirements

As described above, on October 28, 1987, the Office of Management and Budget (OMB), citing authority of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), disapproved certain information collection requirements in the expanded scope rule, as of the rule's effective date. On December 4, 1987 (52 FR 46075), OSHA published OMB's letter describing its determination in a notice in the **Federal Register**. (See also 53 FR 15033 (Apr. 27, 1988) (OMB letter to Department of Labor dated April 13, 1988)).

The provisions that OMB disapproved were: (1) The requirement that material safety data sheets be provided on multi-employer worksites; (2) coverage of any consumer product that falls within the ''consumer products'' exemption included in section 311(e)(3) of the Superfund Amendments and Reauthorization Act of 1986; and (3) coverage of any drugs regulated by the Food and Drug Administration in the non-manufacturing sector. In accordance with OMB's decision, OSHA did not enforce these three disapproved requirements.

OMB's disapproval of the HCS provisions was challenged in the U.S. Court of Appeals for the Third Circuit. On August 19, 1988, the Court of Appeals invalidated OMB's actions as being outside OMB's authority under the Paperwork Reduction Act. *United Steelworkers of America* v. *Pendergrass*, 855 F.2d 108 (3d Cir. 1988)(Ex. 4–190). The Court held that the three disapproved HCS provisions did not require ''collection of information'' under the Paperwork Reduction Act and embodied substantive policy decisionmaking entrusted to OSHA. *Id.* at 112. The Court ordered that: ''The Secretary [of Labor] shall publish in the **Federal Register** a notice that those parts of the August 24, 1987 hazard communication standard which were disapproved by OMB are now effective.'' *Id.* at 114.

On September 2, 1988, the U.S. Department of Justice filed a petition with the Third Circuit requesting a rehearing and suggesting a rehearing *en banc*, which automatically stayed the effect of the Court's order. The Court denied the petition for rehearing (November 29, 1988), as well as requests for stay of the decision. In addition, a further motion by industry representatives for a stay of the decision was denied by U.S. Supreme Court Justice Brennan (January 24, 1989), and by the full Court upon reconsideration (February 21, 1989).

The Third Circuit's decision became effective January 30, 1989. As ordered by the Third Circuit, OSHA published a notice in the **Federal Register** on February 15, 1989 (54 FR 6886) to inform affected employers and employees that all provisions of the HCS were in effect in all industries. As a matter of enforcement policy, OSHA did not check for compliance with the three provisions in programmed inspections until March 17, 1989.

To implement the court order, technical amendments were made to the HCS to delete from notes following the headings of the standard, and from the parentheticals following the text of the standard, statements that any provisions of the HCS are disapproved by OMB. The OMB-assigned control number for the approved collection of information requirements of the HCS remain following the text of the standard. The Paperwork Reduction Act requires display of OMB control numbers with all information collection provisions.

Following the decision in *United Steelworkers,* the Solicitor General requested the Supreme Court on behalf of the United States government to review the case, and the Court granted its request. In *Dole* v. *United Steelworkers of America*, the Supreme Court affirmed the judgment of the Third Circuit. 110 S.Ct. 929 (1990). The Court held that the term ''collection of information'' in the Paperwork Reduction Act refers solely to the collection of information by or for the use of a federal agency, and does not cover rules mandating disclosure of information to a third party. *Id.* at 937. Thus, the OMB-disapproved provisions reinstated by the Third Circuit continue to be in effect.

The primary purpose for the 1988 HCS NPRM was to address the issues related to the OMB disapproval. As the Third Circuit has invalidated OMB's disapproval, and that decision was upheld by the Supreme Court, those provisions are no longer considered to be information collection requirements subject to OMB review and approval. The modifications in this final rule are based upon OSHA's determination that

clarifications would enhance compliance and thus protection of workers. The only information collection burdens for the rule involve access by OSHA during inspections to records maintained by the employer. These were approved by OMB on June 24, 1991 until April 1994 (control number 1218–0072). As this final rule does not affect the access burden, OSHA is not submitting this rule for further consideration under the authority of the Paperwork Reduction Act.

F. Advisory Committee on Construction Safety and Health (ACCSH)

As discussed in the preamble to the August 1987 final rule (52 FR 31858–59), the ACCSH reviewed a draft notice of proposed rulemaking to expand the scope of the HCS to construction on June 23, 1987. The ACCSH went through the NPRM line-by-line, making recommendations to adapt it to the construction industry, *i.e.,* the document with the recommended changes constituted an ACCSH recommended standard for hazard communication (Ex. 4–186). A number of the recommendations were adopted (*e.g.,* the definition of workplace was modified to include job sites or projects; the written hazard communication program requirements were amended to state more clearly that the programs are to be maintained at the site).

As the 1988 NPRM addressed issues that affect construction, OSHA transmitted a draft of it to the ACCSH for review and comment. In a meeting on March 30, 1988, the ACCSH did not provide specific recommendations on the NPRM. The ACCSH reiterated its desire to have a separate standard for construction, and appointed a subcommittee to make further recommendations to the Assistant Secretary. However, the ACCSH also reaffirmed that the standard as written should be implemented on May 23, 1988 as originally scheduled.

The ACCSH-appointed subcommittee reviewed the standard again and prepared new recommendations. The full committee voted to submit the subcommittee's recommendations to OSHA at their meeting on November 30, 1988. Their recommendations are in the record as Exs. 14–1, 14–2, and 14–3.

The focus of their recommendations was to reorganize the requirements of the rule by removing any provisions that apply primarily to chemical manufacturers and importers. Their proposed draft rule either deleted the requirements or moved them to an appendix. OSHA does not agree that these requirements should be removed from the rule. It is important for construction employers to be aware of what information they are entitled to, and the distribution mechanisms. Reorganization as suggested by the ACCSH detracts from the logical presentation of the requirements, and makes the rule more difficult to understand. OSHA believes that the addition of non-mandatory Appendix E provides sufficient guidance for construction employers, as well as all other employers using chemicals, to guide them to the applicable provisions of the rule.

In addition, the ACCSH subcommittee suggested that a definition be added for a ''competent person,'' and that such individuals be given certain duties under the rule. OSHA does not believe that this is a provision that would add to the protections of the rule. The HCS is intended to train all workers about the hazards of chemicals and appropriate protective measures. It is not clear what additional training a worker would have to have to be designated a ''competent person.'' The intent of the rule is to ensure that all workers are trained to be ''competent.'' In addition, it was suggested that the ''competent person'' would have the authority to stop the job or correct the hazards. This type of action is beyond the information transmittal requirements of the HCS.

II. Pertinent Legal Authority

The primary purpose of the Occupational Safety and Health Act (the Act) (29 U.S.C. 651 *et seq.*) is to assure, so far as possible, safe and healthful working conditions for every American worker over the period of his or her working lifetime. One means prescribed by the Congress to achieve this goal is the mandate given to, and the authority vested in, the Secretary of Labor to set mandatory safety and health standards.

Authority for issuance of this standard is found primarily in sections 6(b), 8(c)(1), and 8(g)(2) of the Act. 29 U.S.C. 655(b), 657(c)(1), 657(g)(2). Section 6(b), and in particular Section 6(b)(5), governs the issuance of occupational safety and health standards dealing with toxic materials or harmful physical agents. Section 8(c)(1) of the Act empowers the Secretary to require employers to make, keep, and preserve records regarding activities related to the Act and to make such records available to the Secretary. Section 8(g)(2) of the Act empowers the Secretary to ''prescribe such rules and regulations as [she] may deem necessary to carry out [her] responsibilities under this Act * * *.''

Section 3(8) of the Act, 29 U.S.C. 652(8), defines an occupational safety and health standard as follows:

> [A] standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide a safe or healthful employment and places of employment.

In addition, Congress specifically stated in section 6(b)(5) that:

> The Secretary, in promulgating standards dealing with toxic materials, or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of standards, and experience gained under this and other health and safety laws. Whenever practicable, the standard promulgated shall be expressed in terms of objective criteria and of the performance desired.

The Supreme Court has said that section 3(8) applies to all permanent standards promulgated under the Act and requires the Secretary, before issuing any standard, to determine that it is reasonably necessary and appropriate to remedy a significant risk of material health impairment. *Industrial Union Dep't* v. *American Petroleum Institute,* 448 U.S. 607 (1980). The ''significant risk'' determination constitutes a finding that, absent the change in practices mandated by the standard, the workplaces in question would be ''unsafe'' in the sense that workers would be threatened with a significant risk of harm. *Id.* at 642. This finding, however, does not require mathematical precision or anything approaching scientific certainty if the ''best available evidence'' does not warrant that degree of proof. Id. at 655–656; 29 U.S.C. 655 (b)(5). Rather, the Agency may base its findings largely on policy considerations and has considerable leeway with the kinds of assumptions it applies in interpreting the data supporting it. 448 U.S. at 656.

Moreover, under the authority of Section 6(b)(7), 29 U.S.C. 655(b)(7), any standard issued by the Secretary shall contain requirements that are essentially ''information-gathering'' in function, including:

* * * prescrib[ing] the use of labels or other appropriate forms of warning as are necessary to insure that employees are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions of safe use or exposure.

These requirements may be imposed at levels of risk below what would be necessary for the setting of exposure limits because they serve the purpose of ''keep[ing] a constant check on the validity of the assumptions made in developing the permissible exposure limit, giving it a sound evidentiary base for decreasing the limit if it was initially set too high.'' *Id.* at 658 (footnote omitted). They also provide basic protections for workers in the absence of specific permissible exposure limits, particularly by providing employers with guidance for designing protective programs.

After OSHA has determined that a significant risk exists and that such risk can be reduced or eliminated by a proposed standard, it must set a standard ''which most adequately assures, to the extent feasible on the basis of the best available evidence, that no employee will suffer material impairment of health * * *.'' 29 U.S.C. 655(b)(5). The Supreme Court has interpreted this section to mean that OSHA must enact the most protective standard possible to eliminate a significant risk of material health impairment, subject to the constraints of technological and economic feasibility. *American Textile Manufacturers Institute, Inc.* v. *Donovan* (*ATMI*), 452 U.S. 490 (1981). The ''feasibility'' constraint has also been described simply as limiting standards to requiring only what is ''capable of being done'' or ''achievable.'' *Id.* at 508–509. The Court held that ''cost-benefit analysis is not required by the statute because feasibility analysis is.'' *Id.* at 509. The Court stated that the Agency could use cost-effectiveness analysis and choose the less costly of two equally effective standards. *Id.* at 531 n.32.

A. Finding of Significant Risk

In *United Steelworkers of America* v. *Auchter*, 763 F.2d 728, 735 (3d Cir. 1985), the U.S. Court of Appeals for the Third Circuit concluded, as a threshold matter, that the hazard communication rule is a section 6 standard under the Act which is aimed at correcting a particular ''significant risk'' in the workplace. The HCS is not ''merely an enforcement or detection procedure designed to further the goals of the Act generally.'' *Id.* (quoting test for distinguishing standards from regulations first explained in *Louisiana Chemical Ass'n* v. *Bingham*, 657 F.2d 777, 782 (5th Cir. 1981)). See also *Associated Builders & Contractors* v. *Brock,* 862 F.2d at 67.

The practices mandated by the standard—hazard evaluations, written hazard communication programs, labels and other forms of warning, material safety data sheets, and information and training—are, at bottom, directed not merely at the identification of workplace chemicals, but more significantly at the correction of their hazards as well. This correction will occur largely as a result of employee compliance with instructions on how to protect themselves when exposed to hazardous chemicals that are an integral part of any hazard communication program, as well as by other hazard-reducing strategies adopted by employers when they become more aware of the hazards in their workplaces (*e.g.,* chemical substitution). And because the record clearly indicates that inadequate communication about serious chemical hazards endangers workers, and that the practices required by this standard are necessary and appropriate to the elimination or mitigation of these hazards, the Secretary is able to make the threshold ''significant risk'' determination that is an essential attribute of all permanent standards. The Third Circuit Court of Appeals agreed that ''inadequate communication is itself a hazard, which the standard can eliminate or mitigate.'' *United Steelworkers* v. *Auchter,* 763 F.2d at 735.

A number of commenters have questioned OSHA's general finding of significant risk. These commenters argue that OSHA needed to find significant risk: (1) For each industry covered (*e.g.*, Ex. 84 (construction)); (2) for each chemical covered (*e.g.*, Ex. 11–129 (grain dust)); and (3) for each exposure situation (*e.g.*, Ex. 85 (mixtures, articles)). Although these comments are addressed in more detail in Part III of this preamble where the rule is summarized, briefly, it is clear from the relevant court decisions that these specific findings are not required for a standard such as this, where the risk of inadequate knowledge is the same in every application of the standard.

In *Associated Builders & Contractors* v. *Brock,* 862 F.2d 63 (1988), the Third Circuit responded to the first two complaints against OSHA's significant risk finding. The Court noted that the general significant risk finding for the original 1983 rule was appropriate for the entire manufacturing sector, even though OSHA did not make individual findings for each of the twenty major Standard Industrial Classification (SIC) Code manufacturing subdivisions. *Id.* at 67. The Court concluded that ''[t]here is no more obvious need for industry specific significant risk determinations for the [non-manufacturing] industries than for subdivisions of the manufacturing sector.'' *Id.* at 67–68. The Court held that for this ''performance-oriented information disclosure standard covering thousands of chemical substances used in numerous industries * * * the significant risk requirement must of necessity be satisfied by a general finding concerning all potentially covered industries. A requirement that the Secretary assess risk to workers and the need for disclosure with respect to each substance in each industry would effectively cripple OSHA's performance of the duty imposed on it by 29 U.S.C. 655(b)(5); a duty to protect all employees, to the maximum extent feasible.'' *Id.* at 68. OSHA was not required to assess individually the significant risk that would be alleviated by the HCS's application to each of the seventy major business classifications, much less for each of the hazardous substances used in those industries.

As for arguments that OSHA should only apply the HCS where chemical exposures pose known significant risks (*e.g.*, Ex. 85), the Agency concludes that neither the record evidence nor policy considerations support such an approach. The record shows that although chemical manufacturers or importers may know, in principle, the use to which their product will be put, they generally do not know enough about downstream operations to make reliable predictions about downstream exposure levels. Therefore, information must be provided for all hazardous chemicals to which employees may be exposed, regardless of any judgments by the chemical manufacturer or importer about possible levels of risk. 48 FR 53295, 53296, 53307. Furthermore, to allow chemical manufacturers or importers to edit hazard information based on their predictions of the extent of downstream exposures is to deprive downstream employers and employees an opportunity to make an effective assessment of potential hazards based on complete information on the individual chemical and in light of any possible additive or synergistic effects that may be posed by the presence of other hazardous chemicals in the workplace. *Id.* at 53295, 53323. OSHA finds that workers would be threatened with a significant risk of harm if chemical manufacturers or importers are

allowed to delete hazard information based on a presumption of downstream risks, thus depriving downstream employees and employers from having complete information on which to base their decisions regarding control measures. See, *General Carbon Co.* v. *OSHRC*, 860 F.2d 479 (DC Cir. 1988).

In addition, in light of § 6(b)(7) of the Act requiring OSHA to ''insure that employees are apprised of all hazards to which they are exposed,'' the Agency concludes that employees must be informed about all potential hazards before the worker is exposed to them and not only when there is overexposure. Linking HCS applicability to downstream exposures posing a significant risk is contrary to the standard's very purpose: to change downstream employer and employee behavior before adverse health effects occur. 48 FR 53296. OSHA has concluded that imposing informational requirements is necessary and appropriate to protect workers even when OSHA has not determined that the level of risk at a particular worksite warrants a substance-specific standard that would employ more elaborate types of controls. *Cf. Associated Builders & Contractors,* 862 F.2d at 67–68; *United Steelworkers,* 819 F.2d at 1269–70.

B. Finding of Feasibility

OSHA originally chose to direct the HCS to employers in manufacturing, based on what were believed at that time to be relevant policy considerations. The Third Circuit held that ''[o]nce a standard has been promulgated, however, the Secretary may exclude a particular industry only if he informs the reviewing court, not merely that the sector selected for coverage presents greater hazards, but also why it is not feasible for the same standard to be applied in other sectors where workers are exposed to similar hazards.'' *United Steelworkers*, 763 F.2d at 738. Therefore, because inadequate communication of chemical hazards is itself a significant risk, *id.* at 735, OSHA was required by the Court order to apply the HCS to all workplaces where employees are exposed to chemical hazards, to the extent feasible.

The feasibility question raised by the HCS is not difficult to resolve. This standard does not relate to activities on the frontiers of scientific knowledge; the requirements are not the sorts of obligations that approach the limits of feasibility. *Associated Builders & Contractors,* 862 F.2d at 68. The record on which the original and expanded HCS's were based did not contain credible evidence that the HCS would be technologically or economically infeasible for any industrial sector, *id.,* and there was substantial evidence of feasibility, 52 FR 31855–58.

Part III of this preamble addresses in more detail the comments which argue that individual requirements of the rule are infeasible (*e.g.,* Exs. 29 (distribution of MSDSs by wholesalers); 32 (provision of MSDSs at construction sites)). As a general matter, however, OSHA concludes that there is substantial evidence in the record that the performance-oriented, informational provisions of the HCS are capable of being done, and will not threaten any industry's ''long-term profitability,'' *ATMI,* 452 U.S. at 531 n.55.

Certainly, the technical expertise needed to develop the chemical hazard information is feasible for producers of the hazardous chemicals. See, *e.g.,* 48 FR 53296–99. Likewise, there are no technological barriers preventing implementation of the other HCS requirements, in that they are conventional and common business practices that are administrative in nature. 52 FR 31855.

Moreover, OSHA concludes that the HCS administrative requirements can be economically incorporated into present practices. OSHA believes all businesses that produce, distribute, and use chemicals can ensure that their containers are maintained with proper hazard warnings just as these businesses would maintain labels or markings on containers to ensure that downstream purchasers and workers handling or using the chemicals comprehend the containers' contents and intended uses. Hazard information can be sent from supplier to user just as suppliers are able to send the chemical product itself to the user. All employers are able to acquire and maintain up-to-date MSDSs for hazardous chemicals just as they are able to acquire and maintain up-to-date cost information and performance specifications on those very same products. OSHA also concludes it is feasible for employers to inform and train workers regarding chemical hazards present in the workplace just as employers are capable of instructing and training their workers to perform their jobs in an efficient and speedy manner. 52 FR 31856–57. OSHA concludes that the record contains substantial evidence of the economic feasibility of the HCS, including such evidence as: (1) The numerous examples of compliance in all industries (see, *e.g., id.,* Ex. 4–169 (71% of the 42,779 manufacturing facilities inspected by OSHA from the initial compliance date to Feb. 1988 in full compliance; of those cited for violating the HCS, majority had a hazard communication program although it was deficient in some respect)); (2) the similar implementation of other Federal communication laws and of state laws (see, *e.g.,* Ex. 4–183 (some 1000 employers inspected by Maryland Apr. 1, 1987 to Mar. 31, 1988, in total compliance with state law; over 1100 non-manufacturing workplaces inspected by Tennessee Oct. 1, 1987 to June 30, 1988, in total compliance), 4–184 (over 16,000 establishments inspected by Washington Jan. 1, 1987 to Dec. 31, 1987, in total compliance)); (3) the detailed regulatory impact and regulatory flexibility analyses which concluded that the costs associated with the HCS were negligible in relation to revenues and profits of affected industries (Ex. 4–1, 4–2. See also 52 FR 31867–76, 53 FR 29846–49); and (4) the development of numerous guidelines and consultative services offered by the Federal Government, States, trade associations, unions, professional organizations, and private consultants (see *e.g.,* 52 FR 31857, 53 FR 29848; Exs. 4–116, 4–118, 4–121, 4–122, 4–123, 4–128, 4–129, 4–130, 4–137, 4–138, 4–139, 4–144, 4–147, 4–148, 4–149, 4–150, 4–151, 4–154, 4–157, 4–158, 4–159, 4–160, 71–16, 71–55, 71–58, 71–61.)

OSHA has tailored the standard for a number of manufacturing and non-manufacturing operations to ensure that its requirements are feasible and effective in protecting all workers. See 52 FR 31858. *Cf.* 452 U.S. at 531, n.32 (OSHA can choose the less costly of two equally effective standards.) Modifications adopted in this final rule also act to tailor the rule to be more effective by incorporating language which clarifies the requirements.

III. Summary and Explanation of the Issues and the Provisions of the Final Rule

The regulatory text presented in this document reprints the entire final rule with the adopted modifications incorporated into the existing provisions. However, the discussion which follows is limited to the adopted changes and related issues raised in the record. It does not provide a complete summary and explanation of all of the provisions of the rule—for such information interested parties should refer to the preambles of the original (48 FR 53334–40) and revised (52 FR 31860–67) final rules.

While the primary purpose of publishing the NPRM was to resolve the issues raised by OMB and presented in the proposed and alternative provisions, OSHA also invited comment on other related issues. (As described in the background section above, due to a decision issued by the U.S. Court of

Appeals for the Third Circuit, subsequently upheld by the U.S. Supreme Court, the OMB disapproval has been invalidated.) In reopening the record, OSHA recognized that it was not operating ''on a clean slate.'' In developing the revised final rule in 1987, OSHA had the benefit of an extensive evidentiary record. In addition, the Agency's experience gained under the original standard, as well as under state standards, some of which already applied to the nonmanufacturing sector, further supported OSHA's regulatory approach. OSHA continues to believe that the record substantially justifies the Agency's regulatory choices, and the information presented to OSHA since the standard was issued in 1987 has not convinced OSHA that significant changes are warranted to comply with the OSH Act. This final rule reflects that position. There are no substantial changes in the requirements, and OSHA is simply promulgating clarifications and modifications to enhance compliance.

As noted in the NPRM, OSHA retains ''almost unlimited discretion to devise means to achieve the Congressionally mandated goal.'' *United Steelworkers of America* v. *Marshall,* 647 F.2d 1189, 1230 (D.C. Cir. 1980), *cert. denied,* 453 U.S. 913 (1981). *Accord, Building and Construction Trades Dept., AFL–CIO* v. *Brock,* 838 F.2d 1258, 1271 (DC Cir. 1988). As the Agency determined at the time of the original final rule in 1983 that all employees exposed to hazardous chemicals are at significant risk of experiencing adverse health effects without the protections of the HCS, OSHA is statutorily required to extend those protections to those employees unless it can be shown that the requirements are not feasible (*i.e.,* they are not capable of being done). In the 1987 revised final rule, OSHA determined that the provisions are feasible in all industries. The rule's requirements had thus been determined by OSHA to be both necessary for the protection of all workers exposed to hazardous chemicals (*i.e.,* they would mitigate a significant risk of exposure), as well as capable of being done (*i.e.,* are technologically and economically feasible). As a result of these determinations, OSHA published the NPRM with the stated expectation that the standard would not be changed significantly in this final rule unless the Agency received substantial evidence during the rulemaking that a regulatory modification was clearly necessary. This necessity would have to be based on evidence that the 1987 standard is demonstrably infeasible in a specific respect, or that the proposed alternative would significantly increase the standard's intended safety and health benefit or significantly improve its cost-effectiveness.

As will be discussed in detail below, the information submitted during this rulemaking proceeding has convinced OSHA that its regulatory choices are supported by substantial evidence and that significant changes to the rule are unnecessary. However, some of the comments do reflect a lack of understanding of the requirements and of what is necessary for proper implementation of an acceptable program. Hence OSHA is taking the opportunity in this final rule to incorporate modifications to clarify such provisions and enhance compliance.

The discussion of the record which follows is organized in the order the subjects are addressed in the standard for ease of reference.

Scope and Application

Coverage of all industries. As OSHA described in the preamble to the revised final rule (52 FR 31855–59), expansion of the protections afforded by the HCS to all nonmanufacturing industries is supported by the rulemaking record. Evidence collected by OSHA indicates that there is chemical exposure occurring in every type of industry covered (although every employee may not be exposed), and that employees exposed to hazardous chemicals without knowledge of their identities, hazards, and appropriate protective measures are at a significant risk of experiencing adverse effects from such exposures. Furthermore, it is the Agency's position that all such employees are entitled to information regarding the chemical hazards they are exposed to in the workplace (*i.e.,* that they have a fundamental right to know this information), and that a uniform Federal hazard communication standard is the best method to ensure that it is provided. OSHA's regulatory requirements in this regard are consistent with the mandate of the Act (to protect all employees to the extent feasible), as well as with the Court's decisions upon review of the rule.

Despite these explicit determinations by OSHA in 1983 and 1987, as well as by the Third Circuit in its decisions (subsequently upheld by the Supreme Court), and a subsequent reiteration of this determination in the NPRM, there were still some comments submitted which suggested that certain industrial sectors should be exempted from the rule, or only covered by limited provisions. The majority of these were from representatives of the construction industry, and from distributors of hazardous chemicals. The arguments generally involved the degree of risk encountered in the industry, and the feasibility of the requirements. OSHA has not found the arguments regarding infeasibility to be persuasive, nor is there any justification for lessening the protections afforded employees in the industries in question.

Coverage of the Construction Industry

Significant risk—industry perspective. As was described in the preamble to the NPRM, representatives of the construction industry submitted comments objecting to coverage under the revised final rule (53 FR 29827). They argued that the rule's protections were not required in their industry as exposures to hazardous chemicals did not present a significant risk to workers, and construction employees are already required to be trained under the existing construction training standard, 29 CFR 1926.21. Therefore, according to these commenters, whatever risk there is has already been mitigated by the existing training, and any incremental risk remaining is not significant enough to warrant coverage under the HCS.

The comments and testimony received subsequent to the publication of the NPRM reiterate and expand upon this position. For example, a number of commenters opposed the rule in its entirety, suggesting that it is too burdensome, construction is already adequately covered, and the requirements are not appropriate for construction. See, *e.g.*, Exs. 11–9, 11–24, 11–29, 11–114, and 11–142. ''We believe an extension of the Hazard Communication Standard to the non-manufacturing sector is unwarranted and burdensome. Construction workers simply do not face a significant risk of material harm from exposure to chemicals, and the standard is infeasible for the construction industry to implement.'' Ex. 11–114.

A number of commenters suggested that construction should not be covered since workers in this industry only use hazardous chemicals for short periods of time, the quantities they use are small, and they usually work outdoors (see, *e.g.*, Exs. 11–1, 11–73, 11–84, and 11–97).

Similarly, other commenters suggested that only a few chemicals used in construction are hazardous, and thus may warrant providing the protections of hazard communication to exposed workers (Ex. 11–4, asbestos is hazardous and employees should be trained regarding its hazards). It was

also suggested that the definition of what constitutes a hazardous chemical be limited under the rule (Ex. 11–6), and that OSHA cannot cover the only chemicals that pose a true hazard to workers on the construction job site (Ex. 11–114, natural gas seepage).

The majority of the construction industry commenters stated that there is no significant risk in the industry that requires coverage by the HCS. The Associated General Contractors of America (AGC) (Ex. 11–135) suggested to its members that comments submitted to OSHA in response to the NPRM address whether the company believes construction workers face a significant risk of material harm from exposure to chemicals; whether the standard would reduce whatever risks from hazardous chemicals do exist; and whether the rule is feasible. These commenters uniformly responded to AGC's request for this information to be submitted to the record by stating that there is no significant risk in construction, the rule would not reduce whatever risks there are, and the burdens are substantial (see, *e.g.*, Exs. 11–12, 11–18, 11–20, 11–26, 11–36, 11–83, 11–97, 11–135, and 11–157). (The AGC surveyed its membership to collect information regarding their opinions on the HCS and associated burdens. At the time their comments were submitted, only 102 responses had been received from the 8,000 members that are general contractors. Ex. 11–135.)

Most did not provide any specific comments on provisions of the rule, or suggestions for solutions to the problems they identified, other than exempting the construction industry from coverage. Providing no evidence or substantiation for their opinions, they simply stated that there is no significant risk, the risk would not be alleviated by implementation of the rule, and the burden would not be feasible. For example, at least six of this type of response were received from officers of Charlie's Acoustical Systems, Inc. (Exs. 11–16, 11–18, 11–19, 11–20, 11–26, 11–27, and 11–28). ''Chemicals on the construction site are not a significant risk and the manufacturing standard is an infeasible program to implement.'' Ex. 11–26.

The conclusions of some of the commenters on the issue of significant risk are apparently based on their own organizations' reports of illnesses and injuries caused by chemical exposures. According to these industry representatives, the number of injuries reported that are due to chemical exposures is small, and those which do occur are caused by well known hazards (such as burns caused by handling wet concrete). They further contend that the HCS would not alleviate any of those injuries caused by well-known hazards since no new information would be presented to workers. ''[T]he majority of chemical injuries were the result of exposure to concrete. This work is done by union workers with years of experience in this field. It is highly unlikely that training and MSDSs would reduce concrete burns or rashes. Most of which are an allergic reaction.'' Ex. 11–73.

An additional argument is that chemicals are already handled safely on construction sites (Exs. 11–9, 11–83, and 11–142), and in particular, that compliance with existing training requirements in 29 CFR 1926.21 results in adequate information being given to workers about hazardous chemicals. ''With regard to regulating the few chemically related injuries that do occur, OSHA's existing standards regarding employee training (1926.21(b) 2 through 6) address these sufficiently.'' Ex. 11–83.

In its brief summarizing the record, the AGC cites the testimony of various construction contractors indicating that training is already conducted as proof that no additional information is necessary (Ex. 84). They further discount reports of incidents of chemical injuries occurring: ''AGC does not contend that there are no chemical hazards in construction. Rather, AGC maintains that the hazards which exist are well known to employers and employees alike, and that those hazards do not occur with a frequency or intensity which merit the elaborate mechanisms of the revised HCS.''

The AGC also argues that the degree of safety and health training unions have in their apprenticeship training programs also indicates how significant workers consider the risk to be in their particular industry (Ex. 84). ''During the hearing, AGC sought to ascertain from the Building and Construction Trades Department, AFL–CIO (BCTD), how seriously its members take the risk of chemical exposure in construction, by inquiring whether this issue is covered in construction union apprenticeship programs. Unfortunately, BCTD refused to provide any such information, and even objected that the question was irrelevant. Tr. 12/13/88 pp. 134–136. It would appear, however, that if BCTD truly believes that chemical hazard exposure is a major risk to workers, it would readily have introduced evidence showing the emphasis placed on these concerns in apprenticeship training. The failure to produce any such evidence, coupled with an objection to its relevance, speaks volumes.'' (Quoted without footnotes.)

Construction industry representatives also contend that statistics cited by OSHA regarding the incidence of chemical source illnesses and injuries verify that the risk in construction is not significant (see, *e.g.,* Ex. 11–142). By their interpretation, the number of illnesses and injuries is too low to warrant the coverage of the HCS.

Significant risk—employee perspective. Representatives of construction workers participating in the rulemaking do not appear to agree with the AGC's contention that the hazards they face are well known to them, and do not warrant coverage under the HCS. In its brief summarizing the record (Ex. 89), the Building and Construction Trades Department (BCTD) of the AFL–CIO states that ''although the skin rashes and other chemical incidents these employers report are certainly of concern, there are a myriad of other, far more serious illnesses which our members suffer as a result of exposures on the job.'' The BCTD further elaborates by citing scientific studies in the record (Ex. 67, submitted by the Sheet Metal Workers' International Association) which give epidemiological evidence of illnesses occurring in construction workers due to workplace exposures: ''For example, welders suffer from acute and chronic respiratory disease, and show increased rates of lung cancer of up to 74% after 20 years in the trade. Painters, plumbers and floor-layers experience skin conditions, as well as serious central nervous system problems from exposures to solvents. Employees working with man-made mineral insulation suffer from bronchitis; roofers have skin and eye problems, in addition to increased cancers; and masons suffer from silicosis and lung cancer. Indeed, some of these problems, rather than being minimized by outdoor work, are exacerbated by exposures to sunlight.'' (Quoted from Ex. 89 without footnote cites.)

In response to questions raised during their oral testimony, the BCTD also addressed the issue of underreporting of illnesses and injuries in construction by reference to the National Academy of Sciences study on reporting of illnesses and injuries (Ex. 41): ''That National Academy of Sciences study did dramatically find an under-reporting of illnesses in the construction industry.'' Tr. 6–97. Another report on recordkeeping prepared by the Keystone Center was also referred to: ''And it was agreed upon by that Keystone Center, in their report, that there are serious under-reporting of illnesses in the

construction industry. Actually, across all industries, but more notably the construction industry, because of the latency of most of the illnesses.'' Tr. 6–97–98.

The Sheet Metal Workers stated in their testimony: ''We, in the Sheet Metals Workers', our contractors, and others in construction unions, know that many more health hazards exist on a construction site than is generally believed.'' (Tr. 5–100.) The testimony further pointed out that products that were once considered to be fairly safe (*e.g.,* asbestos) were later found to be highly hazardous. ''As we attempt to cope with the problems of our members with asbestos disease, we are also watching closely research which is unfolding around man-made mineral fibers. Within the past year, Johns-Manville and Owens-Corning have modified their material safety data sheets to recommend the use of respirators for those working around its fiberglass products.'' (Tr. 5–101–2.) Other substances of concern include those in welding fumes, and propellents in adhesives used in asbestos removal work (such as methylene chloride)(Tr. 5–102). ''We want to share in the same protections from those and other health hazards that OSHA offers to our union sisters and brothers, and those in other walks of life. For many obvious reasons, we can't allow the same, or similar kinds of exposures to happen to yet another generation of sheet metal workers.'' (Tr. 5–102)

Another employee representative asked the Coalition panel to comment on the conclusion of the NAS report, which was read into the record as follows (Tr. 5–87–9): ''The only illness data from the BLS annual survey that might be useful for any purpose, may be those on occupational skin diseases, all other illnesses included on the annual survey form are under-reported and can be used only with great caution.'' The conclusion of the report was further quoted as reading: ''For all of these reasons, data on occupational illnesses in the annual survey, other than those for skin diseases, are understated to the point that they are more misleading than useful.'' The panel declined to comment on this conclusion. The study was entered into the record (Ex. 41).

The AFL–CIO also addressed the issue of significant risk in construction in their oral testimony: ''Contrary to the OMB and industry claims, it is clear that chemicals do pose a significant risk to construction workers and to workers at multi-employer worksites—paints, solvents, heavy metals, adhesives, put painters, iron workers, and roofers at serious risk of disease. And these workers, like other workers, exposed to toxic chemicals, should receive the full protections of the standard.'' Tr. 7–44.

Significant risk—OSHA's findings. As has been discussed previously in this preamble, as well as in the preambles to the final rules in 1983 and 1987 and the Third Circuit litigation on the HCS, OSHA has determined that there is a significant risk to all workers exposed to hazardous chemicals without benefit of information regarding those hazards, the identities of the chemicals, and associated protective measures.

This finding of significant risk applies to construction employment as well as to every other type of industry regulated by OSHA. The sole difference in construction is that those employers in complete compliance with the existing construction training standard (29 CFR 1926.21) will have already done most of the training required under the HCS. Therefore, the burden of compliance is less for construction than for any other of the nonmanufacturing industries.

Although the AGC claims in its post-hearing brief that ''the rulemaking record as a whole does not support the finding that the standard is reasonably necessary to reduce significant risk'' in the construction industry (Ex. 84), OSHA does not agree. The AGC cites as its primary evidence the statements made by its own representatives and those of other industry sources that the rule is not needed. OSHA believes that the record accumulated since the 1987 rule was published amply demonstrates that the majority of the participating representatives of the construction industry do not want the rule to apply to them. That, however, is quite different than demonstrating that the rule is neither necessary nor feasible in the construction industry. OSHA does not believe that the record evidence supports either of those conclusions.

As OSHA established in the 1983 final rule (48 FR 53284–86), thousands of chemical source illnesses and injuries are reported annually in the construction industry. The numbers are substantial, and yet all scientific indications are that the illnesses are probably grossly underreported (47 FR 12094–95; 48 FR 53284–86; Ex. H–022: 17; Exs. 4–1 and 4–2; Ex. 4–70; Ex. 4–44; and Ex. 41).

The Coalition of Construction Trade Industry Associations (hereinafter referred to as ''the Coalition'')(Ex. 11–142) claims that the reported incidence rate of chemically-related illness is too low to be considered significant. This is not true. In fact, construction is third after agriculture and manufacturing in terms of incidence rates, and thus exceeds the rates of all other nonmanufacturing industries (48 FR 53285).

This has occurred despite the fact that in construction there are a number of factors which tend to contribute to the underestimation of chemical source illnesses and injuries. The transient nature of the workforce minimizes the likelihood that any illness or injury that does not produce an immediate, acute effect (such as concrete burns) is identified and reported. Since a worker may not report back to the same workplace the day after an exposure, even a number of acute effects would be unreported. Thus any effect which has a latency period of more than one day will generally not be included in the illness and injury log and linked to occupational exposures. This is aptly demonstrated by the anecdotal reports of injuries being limited to concrete burns and similar ailments (Ex. 11–135; Tr. 6–20, 21; Tr. 6–28), while the scientific epidemiological data based on studies of exposed construction workers whose health status was followed over longer periods of time reveal the incidence of serious, chronic health effects (Ex. 67).

The ability of employers to identify occupational illnesses with chemical exposures is always a concern, particularly since the effects of exposure are effects which may also be caused by other factors. As cited in the original NPRM preamble (47 FR 12094), the Bureau of Labor Statistics (BLS) noted this reporting disparity in its annual report. ''The recording and reporting of illness continue to present some measuring problem since employers (and even doctors) are often unable to recognize some illnesses as being work related. The annual survey includes data on only current and visible illnesses of workers; it does not include data on illnesses which might surface later.''

So if workers being exposed to solvents have headaches and feel nauseous, this may not be identified as being caused by their chemical exposures when in fact they are experiencing central nervous system depression. Part of the purpose of the HCS is to increase awareness regarding these potential effects. In fact, improved reporting of occupational illnesses and injuries caused by chemical exposures is expected to be one of the positive effects of the HCS.

The comments and testimony submitted by the construction industry suggest that some construction employers are either unaware of the extent of potential hazardous effects in their industry, or are attempting to minimize the evidence of the

seriousness of the types of effects which may occur as a result of employee exposure. For example, Trio Construction Services, Inc. (Ex. 11–100) supports an exemption for the construction industry ''because the construction industry is not a user of today's highly toxic materials, chemicals, carcinogens, explosives, etc.'' And yet Trio indicates further that their company uses ''gasoline, kerosene, fuel oil, WD–40, paints, lacquers, thinners, adhesives, concrete, oxygen and acetylene to name a few.'' By the definitions of hazard in the rule, the types of chemicals cited do indeed include ''highly toxic materials, chemicals, carcinogens * * *.''

Similarly, the Ruhlin Company (Ex. 11–97) argues that ''many chemicals utilized by Construction Contractors such as water repellents, form release agents, concrete sealers, solvents, adhesives, bonding agents, epoxy resins, linseed oil and curing compounds are non toxic * * *'' This too reveals a lack of information regarding the hazardous properties of chemicals as these types of products commonly include numerous hazardous chemicals.

The AGC itself admitted in a newsletter to its members that there are 82 hazardous chemicals employees involved in concrete work may be exposed to, including such potential carcinogens as benzene and vinyl chloride (Ex. 4–98). In addition, an AGC representative submitted about 400 MSDSs with his notice of intent to appear at the public hearing (Ex. 13–39), including MSDSs for a number of the chemicals listed by Trio and Ruhlin above. The hazards of the chemicals covered by those MSDSs cover a full range of health effects, as well as physical hazards.

Clearly, these comments and references indicate that chemical exposures in the construction industry are extensive, and that the hazards are not apparently as ''well known'' as the AGC has indicated (Ex. 84).

The industry representatives argue that the transient nature of the work force must result in unique treatment of the industry from a regulatory standpoint, yet they do not seem to recognize that the same industry characteristic results in an underestimation of the magnitude of the problem with respect to chemical exposures.

For example, they argue that exposures are, in essence, relatively isolated instances of brief duration. There is no recognition in their comments that painters exposed on one site today and another tomorrow throughout their working careers have a significant cumulative dose of chemical exposures. In the industry's perspective, viewing exposures as a finite occurrence, the need for the standard is limited and the possibility of disease occurring as a result is remote. In fact, professional trade workers generally use the same types of chemicals from job to job (although the specific constituents may vary) and their potential for long-term substantial exposure is significant. (The industry representatives use the similarity of job exposures to argue for ''portability'' of training, yet do not seem to recognize that it contributes to the occurrence of chronic disease that is not reported.)

The arguments that the work is completed outdoors and is therefore insignificant are also not persuasive. (See, *e.g.,* Ex. 11–91.) Much construction work is finish or repair work that is conducted indoors, and significant exposures can occur. Outdoor exposures are not guaranteed to be low. A recent article describing exposure to lead at an outdoor site found that the measured levels far exceeded legal limits (Ex. 71–31). No industry representatives submitted exposure data to support their contentions, and it is highly likely that such data do not exist as many of these employers do not generally measure for exposures.

In fact, according to the Coalition, employers don't need permissible exposure limit information on MSDSs because they don't understand it anyway and apparently aren't interested in learning about it (Ex. 11–142). ''Nearly all MSDSs provide PELs or TLVs (Threshold Limit Values); none of the labels do. Neither employees nor employers are trained chemists. Since they are incapable of quantifying job-site exposures, PELs and TLVs are useless to them.'' Of course, PELs are legally established exposure limits that must not be exceeded. The purpose of including them on an MSDS is to ensure the downstream employers and employees are alerted to the fact that the product contains a chemical that is regulated, and thus proper protective measures must be implemented.

AGC's argument that the significance workers attach to the risks of chemical exposures can be determined by the number of hours included in union apprenticeship training programs is spurious at best (Ex. 84). And despite AGC's claims to the contrary, the BCTD's refusal to respond to AGC's inquiries regarding such programs does not indicate that its members do not consider the issue to be important (Tr. 6–134–36). As counsel for the BCTD indicated, ''the employer has the responsibility to ensure safety on the work site, and that includes the safety training and hazard communication identification.'' (Tr. 6–135.) Nevertheless, a member of the BCTD panel had already addressed knowledge gained in apprenticeship programs (Tr. 6–91–3), and in response to similar inquiries from the AGC, both the Sheet Metal Workers (Tr. 5–113–14; Ex. 81) and the AFL–CIO (Tr. 7–77–78) confirmed that such training is in fact included in union programs, and that the emphasis on such information has increased in recent years.

There were suggestions in the record that unions be required to assume some of the compliance burden. The Flat Glass Marketing Association indicated that unions should be held responsible for training since the contractors frequently hire employees from union halls (Ex. 11–152). ''There is no reason why OSHA should not require the unions to include in their apprenticeship training programs courses on hazardous chemical identification, detection, and treatment. The unions should be required to cooperate with the employers in developing and conducting such programs insofar as they deal with communicating the hazards of chemicals on the job site.''

The reason that this is not a viable option for the HCS is that OSHA has no authority under the Act to compel employees or their representatives to provide training. Although section 5(b) of the Act requires ''[e]ach employee comply with all occupational safety and health standards and all rules, regulations and orders issued under the Act'' that are applicable, Congress ''[did] not intend the employee-duty * * * to diminish in any way the employer's compliance responsibilities or his responsibility to assure compliance by his own employees. Final Responsibility for compliance with the requirements of this [A]ct remains with the employer.'' S. Rep. No. 1282, 91st Cong. 2d Sess. 1–11 (1970). OSHA cannot sanction employees or their representatives for failure to provide training. *Atlantic & Gulf Stevedores* v. *OSHRC,* 534 F.2d 541 (3d Cir. 1976).

In addition, since the majority of employees working in this country are not members of unions, such an approach would be ineffective for the great majority of worksites in any event. However, as OSHA has stated a number of times with regard to the training requirements of this rule, the HCS only requires each employer to ensure that training has been provided to employees. If employers and employee representatives in a particular area agree

to some sort of centralized training program so that training on the jobsite will be minimal (limited to the information that is specific to that site), the rule is flexible enough to permit that type of approach. Indeed, OSHA encourages joint efforts where possible because such partnerships result in better and more efficient information transfer. (See, *e.g.,* Exs. 4–63, 4–75.) Employers will be held accountable for the adequacy of the training provided, but need not present all of the information themselves.

Reduction of Risk Through Current Training Requirements. Although, as has been described herein, the construction industry representatives claim that the risk of exposure to chemicals in construction is not ''significant,'' this conclusion is coupled with the contention that the existing training requirements (29 CFR 1926.21) alleviate whatever risk there may be (see, *e.g.,* Exs. 11–135, 11–142 and 84).

The construction training requirements that apply to chemicals may be summarized as follows:

(b)(2) The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to this work environment to control or eliminate any hazards or other exposure to illness or injury.

(b)(3) Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required * * *.

(b)(5) Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in subparts D, F, and other applicable subparts of this part * * *.

(6)(i) All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.

(ii) For purposes of paragraph (b)(6)(i) of this section, ''confined or enclosed space'' means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere * * *.

As OSHA has indicated in its regulatory impact analysis (Ex. 4–1) and in response to questions in the public hearing (Tr. 1–45), the Agency estimated that approximately 75–80% of the training required under the HCS is also required under the construction training standards described above. Thus if a construction contractor was in full compliance with § 1926.21, the incremental training required to complete compliance with the HCS would primarily be limited to the requirements for explanation of the MSDSs, labels, and other features of the employer's hazard communication program.

The primary difference between the two rules is that the § 1926.21 standard is very general and does not provide employers with sufficient guidance to establish an adequate training program for hazard communication. OSHA testified to this point in response to questions raised at the public hearing, Tr. 1–47–8. This has been pointed out repeatedly by members of the Advisory Committee on Construction Safety and Health (ACCSH) (Tr. 6–78–9), and the Agency has attempted to somewhat rectify the problems by providing additional guidance in a compliance directive (Ex. 4–152). However, there are still problems with enforcement due to the way the provisions were drafted when adopted.

The AGC claims that its analysis of the enforcement statistics OSHA entered into the record (Ex. 4–199) indicates that § 1926.21 is one of the most cited Agency rules (Ex. 84). As described in their post-hearing brief, between fiscal year 1982 and fiscal year 1987, OSHA issued 4,205 citations for violations of § 1926.21(b), ''3,814 of which were for § 1926.21(b)(2) governing hazard training.'' A review of the subparagraphs included in paragraph (b) raises questions regarding the AGC's analysis. Subparagraph (b)(2) is a general one which covers all types of hazards, including safety hazards such as trenching, etc. The subparagraphs of primary relevance to chemical hazard training are (b)(3) and (b)(5). When 90% of the citations that have been issued for paragraph (b) involve subparagraph (b)(2), there are clearly very few citations issued for subparagraphs (b)(3) and (b)(5). In fact, in the 6 year period included in the statistics, only 156 citations were issued for violations of (b)(3) and (b)(5). (As a point of reference, in 1990 OSHA issued over 5600 citations for violations of the HCS training requirements. Over 4300 of those violations were cited as being serious, and 32 were considered to be willful.)

There is evidence in the rulemaking record that complete training on chemical hazards is not widespread in the construction industry despite the long-established requirements. As cited in the NPRM preamble (53 FR 29827), the most compelling evidence is a BLS study which indicated that only 23% of construction workers had been trained regarding such hazards. The BLS report was based on a survey administered to construction workers who had been injured on the job.

AGC cites the testimony of employer representatives during the hearing as substantiating that sufficient training is occurring. In OSHA's view, many of the submissions in the testimony and comments support the Agency's position that the current state of chemical hazard training in construction is not sufficient to protect employees. Therefore, the additional training requirements of the HCS are necessary.

Four employer representatives testified on behalf of the Coalition. As a primary argument of construction industry representatives was that current training sufficiently mitigates any risk of exposure that may occur in construction, OSHA questioned these employers on present practices. Specifically, the OSHA panelist asked each employer to ''tell me what kind of training you provide for your workers in accordance with 1926.21, when you do it, and how you get the information in order to do it.''

The first contractor initially indicated that his homebuilding firm did not do any training (Tr. 5–43). He then modified his response to indicate that the superintendents on the job were responsible for training, and he didn't know what was included in the training program (Tr. 5–44).

The second employer representative described in detail training regarding scaffolding and other related safety issues for workers in the masonry industries. When further questioned as to whether the training included any information on chemical hazards as required under § 1926.21, he replied (Tr. 5–46): ''Not at this time. We have conducted one session. We were cited on a Maryland job site through the Maryland OSHA for not having, by their standards, a hazardous communication program in place.'' He also did not appear to be aware that in Delaware, where his firm is located, a state right-to-know law was implemented prior to expansion of the HCS, and it covered construction (Tr. 5–46, 5–60). It is likely his firm would have been in substantial compliance with the HCS if it had complied with the preexisting state law in Delaware. He further indicated later in his testimony that he interpreted the current standard (§ 1926.21) as covering

safety hazards, and not training regarding chemical hazards (Tr. 5–59–60).

The third employer was an electrical contractor, and he stated that safety hazards related to electrical work are addressed in worker training. Coverage of chemical hazards in current training was less clear since he indicated there aren't many products of concern in the electrical industry, and the employers are not sure what is a hazard (Tr. 5–47). Apparently, employers are receiving MSDSs for many products they use that are not actually hazardous chemicals covered by the HCS (*e.g.,* flashlight batteries). Products such as flashlight batteries are exempted as articles under the rule, and thus do not have to be included in training.

Only the fourth contractor employer on the Coalition panel, whose business involved painting, appeared to have clearly included training regarding chemical hazards in his program (Tr. 5–48).

The participants on the AGC's panel described chemical training programs in their organization. The two contractor employers were from states with pre-existing right-to-know laws (Vermont and Wisconsin), and had apparently instituted training programs to comply with those rules. Although they referenced training conducted prior to the right-to-know requirements, it appeared to be safety training. There was no description of chemical hazard training done in compliance with § 1926.21. Ex. 44.

As cited before, there are numerous indications in the comments and testimony of the participants that the hazards in the construction industry are not recognized by the employer representatives, thus it is unlikely that adequate training is being done. (See, *e.g.*, Exs. 11–97 and 11–100.) Comments submitted in response to the revised final rule, for example, clearly indicate that companies were estimating compliance burdens based on analyses that assumed no training had been done to date (see, *e.g.*, Exs. 5–10, 5–65, and 5–117).

As the ACCSH indicated in its 1980 report to OSHA regarding occupational health standards for the construction industry (Ex. 4–4), the construction industry's implementation of § 1926.21 has been hampered by lack of information regarding the hazards of the chemicals in use. As OSHA noted in the preamble to the 1987 final rule (52 FR 31858–59): ''Of particular concern to the Committee at that time was that construction employers do not have access to the necessary information upon which to develop appropriate signs and labels or material safety data sheets, and therefore must depend upon suppliers for such information. '[C]onstruction employers may not always be aware of the hazard associated with a particular product or device if the items are not accompanied upon purchase by appropriate labels and data sheets * * *.' OSHA agrees that this lack of information has been a problem for all downstream users of chemicals, and thus developed the approach incorporated into the HCS—producers or importers of chemicals are responsible for evaluating the hazards and transmitting that information to downstream employers or users of the materials. Under the expanded rule, construction employers would be the recipients in this downstream flow of information.'' The ACCSH further noted that ''such information was fundamental to the preparation of warning signs, labels, training programs, and other important job safety and health activities.''

OSHA's current rule is thus completely consistent with the ACCSH's recommendations in this area. In fact, although the AGC (Ex. 84) and the Coalition (Ex. 11–142) have repeatedly stated that the OSHA rule ''ignores'' the advice of the ACCSH, the record demonstrates that the Agency has not only consulted the Committee but has also incorporated their advice in a number of respects. The requirements of the rule for labels, MSDSs available to employees on-site, and amplified training programs are entirely consistent with substantive recommendations made by the ACCSH in 1980, as well as when they reviewed the rule line by line in 1987 (Exs. 4–6 and 4–186). Ex. 4–186 is an OSHA-prepared working document in which the Agency took the ACCSH transcript from the June 23, 1987 meeting that was a detailed review of the HCS, and incorporated the suggested changes into the text of the rule to most efficiently address the ACCSH comments. As noted in the preamble to the 1987 rule, a number of the suggestions made by the ACCSH were incorporated into the regulatory text (52 FR 31858). At subsequent meetings in 1987 (Ex. 4–74) and 1988 (Ex. 4–108), they further reiterated their view that the rule as written be implemented.

Despite claims to the contrary, the record clearly shows that OSHA has consulted the ACCSH repeatedly on this issue. And on the substantive requirements, the Agency's rule has been entirely consistent with the recommendations of the Committee. The only difference of opinion in approach has been that the Committee would like a separate standard to be promulgated, and the Agency has maintained that such an approach is not appropriate on this particular issue. A difference of opinion does not mean that the Agency has ignored the advice of the Committee.

The AGC and the Coalition have not substantively addressed the specific recommendations of the ACCSH, and have implied that OSHA has not given the Committee an opportunity to present recommendations. Close examination of the documents cited above that are related to specific ACCSH reviews will reveal that the ACCSH's opinions have been addressed by OSHA in the rule's requirements, and that these opinions are quite different than those put forth by the industry representatives who claim the ACCSH has not been properly consulted. From the 1980 report to the most recent recommendations in November of 1988, the Committee has endorsed the need for a standard; confirmed that such a standard is feasible; recognized that availability of information on multi-employer worksites must be specifically addressed; supported requirements for MSDSs, including their availability on site; and emphasized the need for further training requirements. Thus it appears clear that, unlike the AGC and the Coalition, the ACCSH's recommendations for a vertical standard for construction did not mean a rule that is less protective for construction workers than the rules covering workers in other industries.

Employee representatives in the construction industry have also consistently indicated that training is either not being done, or is inadequate (see, *e.g.,* Tr. 6–91–3). In response to a question, the Sheet Metal Workers' representative indicated that the rule would provide information about chemical hazards that they do not currently have under existing regulations: ''Yes, there are adhesives that we are not sure about, that are being used in ventilating systems for coatings. And we are not necessarily sure what they are, except that people will complain about noxious, or obnoxious gases on the job, for example. And we don't know what they are.'' Tr. 5–115–16.

Thus the rulemaking record clearly indicates that the requirements of the HCS are needed to supplement the provisions of § 1926.21. As has been discussed at length in the preamble to the original final rule (see in particular 48 FR 53301, 53305–06, 53310), in order to ensure that the information is effectively communicated, a hazard communication program must include

three components—labels, material safety data sheets, and training. These provisions are interdependent, serving different purposes and communicating the information in a different way, thus improving the effectiveness of the program. (See also H–022, Exs. 3 and 4; 52 FR 31855.) As indicated by the ACCSH, the construction industry employers will benefit from the acquisition of this information as it will enable them to enhance compliance with the training provisions in § 1926.21. As a result of the improved programs, construction employees' significant risk of experiencing adverse effects due to chemical exposures will be reduced. *Associated Builders & Contractors,* 862 F. 2d at 68 (''We reject * * * the contention by ABC and AGC that because the construction industry already provides training in hazardous materials handling, there is no significant risk in that industry. At best that argument establishes the existence of risks, and the requirement for maintenance on the jobsite of information on those risks can only make the existing training more effective.'')

The training requirements of the HCS are more complete, and more specific in terms of what is required. The additional requirements to maintain labels and MSDSs supplied by the producers and distributors of the products used will provide the employer with more information regarding the hazards of the chemicals, identities, and appropriate protective measures. Such information will enable the employer to better protect workers from chemical hazards, as well as improve existing training programs. They will also serve as a reference source for workers to ensure that they truly have access to all applicable information regarding that chemical. As discussed previously, this standard is based primarily on the premise that all workers exposed to hazardous chemicals have a right, and need, to know this basic information.

Feasibility of the rule in the construction industry. In addition to contending that there is no significant risk of exposure in the construction industry, and that the pre-existing training rule mitigates that risk sufficiently, industry representatives claim that the rule as written is infeasible. See, *e.g.,* 11– 36, 11–97, 11–98, 11–114, 11–135, and 11–142. But see also Ex. 71–16: ''Compliance with the OSHA Hazard Communication Standard will not be as difficult as it first appears if you start now and follow an organized approach—in fact, you may already have some procedures in place that comply with the standard.'' (From compliance guidance manual prepared by AGC counsel.)

It is clear that these commenters sought to indicate the rule is infeasible because the Court order to OSHA stated that the rule was to be expanded unless the Secretary of Labor found it would be infeasible to do so. OSHA explicitly determined that the rule is both technologically and economically feasible to implement in all industries. 52 FR 31855–58. Of course, as the Court has recognized, the Agency had already determined that there was a significant risk to employees in all industries where they are exposed to hazardous chemicals without benefit of the information provided under the requirements of the HCS.

Clearly, the HCS does not include any requirements that can be considered to be ''technology-forcing.'' It simply requires the development of information regarding hazardous chemicals, and the transmittal of that information to exposed employees as well as to downstream employers using the materials. For the construction industry, where some training was required prior to the expansion of the rule, the requirements simply involve the preparation of a written program, maintenance of labels on containers within the workplace, obtaining and maintaining material safety data sheets prepared by chemical suppliers, and some incremental additional training of workers. There simply are no issues of technological feasibility in these types of requirements. 52 FR 31856–57.

OSHA completed a regulatory impact analysis prior to promulgation of the 1987 final rule, and found that the standard is economically feasible in all industries (Exs. 4–1 and 4–2; 52 FR 31867–76). The analysis for this rulemaking is limited to the changes that were proposed in the NPRM. OSHA concluded that the changes are not significant or major, and therefore a regulatory impact analysis was not required.

As the BCTD has pointed out (Ex. 89), employers' claims of economic infeasibility are based on cost analyses that use inaccurate assumptions about requirements of the rule. ''While showing that the employer will incur some economic cost in complying with the standard, industry representatives have fallen far short of demonstrating that the cost they project will cause economic dislocation in the industry. But even their projected costs are greatly inflated.'' The BCTD then analyzed projections by the Coalition that a general contractor with ten employees would have to spend $15,197.50 to comply the first year. Without questioning the unit costs used, the BCTD deleted costs assessed for activities that are not required by the rule. As a result, using the Coalition's own figures, the costs would be reduced to $5,053. OSHA believes that even that figure is an overestimation of the actual costs, but in any event, the BCTD's analysis aptly illustrates what OSHA itself has found to be true—that the construction industry's statements regarding feasibility are based on inaccurate and inflated assessments of activities that are not required by the rule.

In fact, statements from the industry representatives themselves conflict on this issue. For example, although the AGC (Ex. 11–135, Ex. 84) and various members of the AGC have indicated that the rule is not feasible, the AGC Dallas (Ex. 11–24) stated: ''All members have been complying with the standard since 23 May, 1988 * * *.'' If the 600 members of the Dallas AGC were able to comply with the rule by May 1988, it cannot be considered to be infeasible. The Dallas AGC is opposed to the HCS, and yet indicate that ''our members have always trained and monitored the safe work practices of their workers which they feel covers nearly 100% of the Hazard Communication training i.e. safety goggles, protective gloves, respirators, etc. and believe the regulation as it now stands is near impossible to comply with.'' It is difficult to understand how the members could have accomplished ''nearly 100%'' of the HCS training prior to the implementation of the rule, and yet have determined that it is ''near impossible to comply with.''

Similarly, the Coalition has argued that the training requirements of the rule are technologically infeasible (Ex. 11–142). And yet the employer representatives testifying on behalf of the Coalition did not indicate that this is the case. In response to a question from OSHA as to whether training of workers before they actually go out on a site is done, and is therefore feasible, the answer was yes (Tr. 5–48–9).

It is somewhat inexplicable to OSHA that the industry representatives can claim that it is feasible to comply with the existing training standards, and yet not with the HCS requirements. Some of the discrepancy can be explained by the inaccurate interpretations regarding training that persist in the industry despite numerous clarifications and corrections by OSHA. On other issues, however, the different positions on the rule are less clear.

For example, the § 1926.21 rule does not address the so-called ''portability''

of training. There is no specific provision in that rule for allowing employers to rely on training provided by some other source, yet employers claim that compliance with that rule is feasible and is being done. On the other hand, the HCS has been criticized for not including such provisions. Ex. 84.

However, OSHA has already provided employers with guidance on this issue in Appendix E to the rule (included in the NPRM at 53 FR 29855, and published separately as a booklet, OSHA 3111). ''An employer can provide employees information and training through whatever means found appropriate and protective. Although there would always have to be some training on-site (such as informing employees of the location and availability of the written program and MSDSs), employee training may be satisfied in part by general training about the requirements of the HCS and about chemical hazards on the job which is provided by, for example, trade associations, unions, colleges, and professional schools. In addition, previous training, education and experience of a worker may relieve the employer of some of the burdens of informing and training that worker. Regardless of the method relied upon, however, the employer is always ultimately responsible for ensuring that employees are adequately trained. If the compliance officer finds that the training is deficient, the employer will be cited for the deficiency regardless of who actually provided the training on behalf of the employer.''

In addition to this guidance in the appendix to the rule, OSHA has also addressed this issue in its instructions to compliance officers enforcing the rule. These instructions are publicly available, and are included in the record at Ex. 4–170. ''Complete retraining of an employee does not automatically have to be conducted when an employer hires a new employee, if the employee has received prior training by a past employer, an employee union, or any other entity.'' It continues: ''An employer, therefore, has a responsibility when hiring a new employee who has been previously trained by someone other than the current employer to evaluate the employee's level of knowledge against the training, information requirements of the standard, and the employer's own program.''

Both of these written interpretations were publicly available in August 1988, and thus the construction industry representatives had access to them prior to submitting comments or oral testimony. In any event, they are also entirely consistent with all previous interpretations of the rule on this issue provided by the Agency since it was first promulgated in 1983. As discussed later in this preamble in the discussion of the information and training provisions, OSHA is clarifying the regulatory text to address this misinterpretation of the rule's requirements. However, OSHA does not find that these claims of infeasibility based on an apparent disregard for current interpretations of the rule to be valid.

If employers in an area choose to establish a centralized training program, perhaps in conjunction with local unions, the rule does not prohibit such an arrangement. If the employers can assure themselves that a worker has been properly trained, re-training is not required.

Another misinterpretation that persists in the industry comments also involves training. Many of the claims of both economic and technological infeasibility in the comments (see, *e.g.,* Exs. 11–135, 11–142, and 84) are based on the misconception that the rule requires training on each chemical, and subsequently each MSDS.

The 1987 HCS (as well as the 1983 rule), stated in paragraph (h)(1): ''Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.'' The training may be done in whatever way employers find appropriate for their particular work operations, as long as all of the elements addressed in the rule are included.

When OSHA published the 1987 rule, the re-training issue was discussed in the preamble (52 FR 31866–67): ''One question that does arise regarding training is whether it needs to be done specifically on each chemical, or whether employers can train regarding categories of hazards. Either method would be acceptable. See 48 FR 53312, 53338. If employees are exposed to a small number of chemicals, the employer may wish to discuss the particular hazards of each one. Where there are large numbers of chemicals, the training regarding hazards could be done on categories (*e.g.,* flammable liquids; carcinogens), with employees being referred to substance-specific information on the labels and the MSDSs. Similarly, the re-training occurs when the hazard changes, not just when a new chemical is introduced into the workplace. If the new chemical has hazards which employees have been trained about, no re-training occurs. If the chemical has a hazard they have not been trained about, re-training would be limited to that hazard.''

This issue was also addressed in Appendix E to the proposed rule (53 FR 29855): ''Information and training may be done either by individual chemical, or by categories of hazards (such as flammability or carcinogenicity). If there are only a few chemicals in the workplace, then you may want to discuss each one individually. Where there are large numbers of chemicals, or the chemicals change frequently, you will probably want to train generally based on the hazard categories (*e.g.,* flammable liquids, corrosive materials, carcinogens). Employees will have access to the substance-specific information on the labels and MSDSs.''

The compliance directive included this topic as well (Ex. 4–170): ''Additional training is to be done whenever a new hazard is introduced into the work area, not a new chemical. For example, if a new solvent is brought into the workplace, and it has hazards similar to existing chemicals for which training has already been conducted, then no new training is required. Of course, the substance-specific data sheet must be available, and the product must be properly labeled. If the newly introduced solvent is a suspect carcinogen, and there has never been a carcinogenic hazard in the workplace before, then new training for carcinogen hazards must be conducted in the work areas where employees will be exposed to it.''

Thus if an employer trains regarding all possible hazards (and there are a total of 23 types of physical and health hazards covered under the rule), there is no re-training required. If the employer chooses to limit the initial training to some subset of the 23 hazards, and a chemical is introduced into the workplace that has a hazard which has not been addressed in the initial training, then re-training must occur.

The construction industry's interpretation of this requirement is not supported by available documentation. The plain reading of the text indicates that re-training is to be done when the hazard changes, and the hazards covered by the rule are defined, yet the industry representatives interpret the requirement as being chemical-specific. See, *e.g.,* Exs. 11–6, 11–15, 11–24, 11–73, 11–84, 11–98, 11–142, and 11–152. (But see Ex. 4–106, Hazard Communication Guide for California Construction by the Safety and Health Committee of AGC of California, at p. 7. (''Training can be for each individual substance, chemical families (solvents, metals), or categories of hazards.'') See

also Ex. 71–16, a manual providing compliance guidance that was prepared by AGC's counsel: ''Depending upon the types of hazardous chemicals used, you may organize the subject matter by specific chemical, by categories of hazard or by work area.'') The cost analyses they present to demonstrate infeasibility are also based on this perception of the rule's requirements (see, *e.g.,* Ex. 11–142).

As will be discussed in the section of this preamble dealing with information and training, OSHA is further clarifying the regulatory text to deal with this issue. In terms of feasibility, however, the Agency finds no evidence to indicate that the rule is infeasible with respect to training, and particularly training of employees who will be working on multi-employer worksites. OSHA has provided substantial guidance to employers regarding these provisions, and such guidance was available prior to, or at the time of, publication of the NPRM. Infeasibility cannot be established through analyses based on misinterpretations of the rule.

OSHA maintains that the rule is both economically and technologically feasible. Industry claims to the contrary are based primarily on inaccurate statements regarding the requirements of the rule, and on assessments that do not account for training that should have been done to comply with s1926.21 or programs that are required under preexisting state standards. There is a cost associated with compliance with this rule as with any other regulation. The cost is justified by the protections that will be afforded employees as a result of implementation of the requirements.

With regard to state requirements, OSHA included in the rulemaking record enforcement data from a number of state plan states that expanded the scope to construction prior to promulgation of the Federal rule (Exs. 4–183, 4–184). As can be seen from these statistics, construction employers in these states are found to be in compliance in the majority of inspections. This evidence indicates that the rule is feasible. For example, the state of Tennessee has a provision for exchanging MSDSs on multi-employer worksites. Yet two-thirds of the employers inspected were found to be in complete compliance with the rule, indicating that they must be able to comply with the requirements for exchanging MSDSs. This is confirmation that the industry arguments discussed above are not substantiated in practice.

In summary, OSHA concludes that there is substantial evidence in the record indicating that there is a significant risk in the construction industry that warrants coverage under the HCS; the current requirements for training under § 1926.21 do not mitigate that risk sufficiently; and the requirements of the rule can feasibly be implemented in the construction workplace.

Coverage of small businesses and ''low hazard'' industries. As discussed in the preamble to the NPRM, OSHA does not consider it to be appropriate to determine the extent of protection afforded an employee by the size of business he/she is employed in (53 FR 29826). Although the Agency does have enforcement policies that take into consideration the size of the business, as well as free consultation services that are primarily intended for small employers without on-staff safety and health capability (see Exs. 4–38 and 4–39), such small businesses must still comply with regulations and ensure that their employees are protected to the same extent as employees of larger businesses.

Several responses to the NPRM again argued that the rule is not feasible for small businesses, and is too costly to implement (see, *e.g.,* Exs. 11–3, 11–39, 11–123, and 11–132). ''The HCS was enacted for all the right reasons but has placed an unreasonable burden on small businesses.'' Ex. 11–39. OSHA recognizes that there are costs involved in achieving compliance, but our analyses indicate that these costs are feasible, and the requirements are necessary to achieve employee protection.

Congressional hearings on the impact of the HCS on small business were convened in both the Senate and the House of Representatives under the auspices of their small business committees. Testimony and statements from the House hearing appear in the record in Ex. 4–198. The Senate hearing took place in June 1989, after completion of the rulemaking comment periods and public hearings.

Following these congressional hearings, the General Accounting Office (GAO) was requested to conduct a study of the HCS with regard to small business by the committee chairs, Senator Dale Bumpers and Congressman Norman Sisisky. The GAO recently completed their investigation, and issued two reports. While these studies are not part of the rulemaking record on this final rule, they contain information that is relevant to these discussions. A single copy of each report may be received free of charge from the GAO. The first, issued in November 1991, is entitled OSHA Action Needed to Improve Compliance With Hazard Communication Standard (GAO/HRD–92–8), and the second, issued in May 1992 is Employers' Experiences in Complying With the Hazard Communication Standard (GAO/HRD–92–63BR). Copies may be obtained by calling the GAO at (202) 275–6241, or writing to them at U.S. General Accounting Office, P.O. Box 6015, Gaithersburg, MD 20877.

In the course of preparing these studies, the GAO conducted a national survey of approximately 2,000 employers in construction, manufacturing, and personal services. Thus the burdens and benefits described by the GAO were self-reported by the employers surveyed. They also collected information through other means, such as OSHA's compliance data, and interviews with affected employers.

The congressional request for GAO to investigate had particularly focussed on the MSDS provisions of the rule. However, GAO found that 70% of those small employers (fewer than 20 employees) who had attempted to comply had little difficulty with the MSDS requirements. Furthermore, while there were costs associated with compliance, the burden was reported to be ''great'' or ''very great'' in fewer than one-fifth of the survey responses.

In addition to assessing burdens, GAO solicited information on the benefits of the HCS. Over 56% reported a ''great'' or ''very great'' improvement in the availability of hazard information in the workplace and in management's awareness of workplace hazards. In addition, about 45% of all employers appearing to comply believed that the rule had been beneficial for workers. And about 30% reported that they replaced hazardous chemicals used in their workplaces with less hazardous ones because of information they received on an MSDS.

Other findings of the GAO will be discussed in this preamble where appropriate. On the whole, however, OSHA is encouraged by the results of their study. While the GAO has suggested improvements in the enforcement and implementation of the rule, the findings are supportive overall of hazard communication and indicate that when employers comply, the expected benefits do occur. Furthermore, employers themselves reported that compliance is achievable.

Similar to the suggestions to exempt or limit coverage for small businesses, there were suggestions that certain ''low hazard'' industries be exempted from the rule as well (see, *e.g.,* Ex. 11–118). OSHA believes that the rule already includes accommodations for many

types of operations that are less hazardous (for example, limited coverage where chemicals are handled in sealed containers), but the rule's protections are necessary for all workers exposed to hazardous chemicals.

Coverage of pesticides. In the NPRM (53 FR 29827–28), OSHA invited comment on an area of potential conflict that had been raised in the comments on the 1987 rule (see, *e.g.,* Exs. 5–6, 5–44, 5–50, and 5–66), involving employees exposed to pesticides. Commenters maintained that OSHA cannot cover pesticide exposures outside the manufacturing sector as these are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136 *et seq.*) administered by the Environmental Protection Agency (EPA). EPA requires pesticides to be labeled, approves the specific label language, and requires the pesticides to be applied in accordance with the labeling instructions.

EPA also has some specific requirements to protect farmworkers exposed to pesticides (40 CFR part 1970), and proposed modifications to provide additional protection on July 8, 1988 (53 FR 25971) (Ex. 4–178).

OSHA invited comment in the NPRM on the relationship of the jurisdictions of EPA and OSHA with regard to the protection of workers exposed to pesticides. For purposes of this discussion, OSHA suggested that its own jurisdiction could be seen to vary with the degree of protection afforded workers under the EPA rules. (53 FR 29827–28.)

The majority of the comments received stated that EPA should retain sole jurisdiction for farmworker exposure to pesticides (see, *e.g.,* 11–14, 11–30, 11–41, 11–55, 11–87, 11–96, 11–101, 11–112, 11–159). Many of these were from state cooperative extension agents. Other commenters indicated that OSHA and EPA should coordinate to have consistent approaches, or that the jurisdictions need to be clarified (Exs. 11–14, 11–32, 11–102, 11–121). Worker representatives tended to believe that OSHA coverage is needed to provide adequate protection (see, *e.g.,* Exs. 11–21, 11–49, 11–144).

EPA and OSHA worked together to coordinate regulations in this area. EPA issued its final Worker Protection Standard for Agricultural Pesticides on August 21, 1992 (57 FR 38102). OSHA has agreed not to cite employers who are covered under EPA's final rule with regard to hazard communication requirements for pesticides. This policy is already in effect. Agricultural employers who are otherwise covered by OSHA will still be responsible for having a hazard communication program for hazardous chemicals that are not pesticides.

Coverage of the agriculture industry. Representatives of the agriculture industry (Exs. 5–6, 5–50) were also concerned that the revised final rule did not mention the Congressional appropriations rider under which OSHA is prohibited from promulgating or enforcing any OSHA standards on farms with 10 or fewer employees unless the farm has a temporary labor camp. As long as this rider is added annually to OSHA's appropriations bill, the protections of the HCS will not apply on those farms. However, farms with 11 or more employees, as well as those with temporary labor camps, are covered by the rule, except coverage of pesticides as discussed above.

Commenters on the NPRM reiterated that they believed the appropriations rider should be specifically referenced in the rule, rather than simply discussed in the preamble (Exs. 11–34, 11–67, 11–78, 11–87, 11–99, and 11– 101). OSHA does not agree. An appropriations rider may change from year-to-year, and is not a determination by the Agency that coverage of such employers is not necessary. Thus it does not belong in the regulatory text of a rule.

Other comments related to the agriculture industry included a suggestion that OSHA should not cite farmers until jurisdictional problems with EPA are resolved (Ex. 11–34). OSHA is not currently issuing citations for violations of the rule with regard to pesticide application in the fields. All other provisions of the rule are being enforced in the agriculture industry. As this same commenter noted, approximately 100,000 farms will have to have programs for chemicals other than pesticides as they have more than 10 employees.

It was also suggested that the HCS is not needed in agriculture as exposures are limited (Ex. 11–67). OSHA does not agree. (See, *e.g.,* 52 FR 16059–61 (Ex. 4–91); Exs. 4–28; 4–102). As discussed in the preamble to the NPRM (53 FR 29826), the HCS is a right-to-know standard, and employees have the right to know as long as the potential for exposure exists in the work operation, and the chemical has been demonstrated to be hazardous. It is also not sufficient to simply tell a worker that a chemical is hazardous, without telling them what the hazard is (Ex. 11–67). The appropriate response to the information presented about the hazard will vary with the type of hazard. A chemical that is flammable requires a different protective response than one that causes skin burns.

Coverage of distributors. A constant feature of the HCS has been the downstream flow of information from suppliers of chemicals to the ultimate users. When the HCS was originally proposed in 1982, it did not explicitly cover importers or distributors. OSHA invited comment on coverage of these suppliers in addition to the coverage of chemical manufacturers that was already included in the NPRM. The Agency stated that explicit coverage may not be necessary because marketplace pressure exerted by manufacturers needing the hazard information would, in fact, ensure that the importers and distributors make it available to their customers.

Rulemaking participants did not agree that this ''marketplace pressure'' approach would work, and overwhelmingly supported explicit inclusion of importers and distributors in the final rule (48 FR 53287–88). As a result of those comments, OSHA required these suppliers to ensure that containers they shipped were labeled, and under the original rule, material safety data sheets were supplied with the initial shipment of a chemical to a manufacturing employer.

A regulatory impact analysis of this requirement indicated clearly that this automatic provision of information to downstream customers was the most efficient and cost-effective way of ensuring that the employers using the chemicals had the information before exposing employees. OSHA considered requiring such suppliers to provide the information on request, but information presented by employers in the rulemaking record indicated that this approach was more costly than the automatic transmittal, as well as being less effective. 48 FR 53330. H–022, Ex. 184. When the rule was expanded to cover nonmanufacturing, importers and distributors were required to provide MSDSs in accordance with the rule to all downstream employers.

A number of representatives of distributors to the non-manufacturing sector have requested that the rule be modified to either exclude them from the requirements of the rule (*i.e.*, require employers to request MSDSs directly from the original chemical manufacturer), or allow them to simply respond to requests rather than affirmatively sending the MSDSs with the first shipment of a chemical to a downstream employer. (See, *e.g.*, Exs. 25, 28, 29, 31, 32, 60, and 62.) ''[T]he intent of the law to provide meaningful and timely notice to employees using hazardous materials can best be fulfilled through the implementation of an as-needed and on-request responsibility for

transmission of MSDS's.'' (Ex. 62; Beauty and Barber Supply Institute, Inc.)

Although OSHA recognizes that complying with this requirement does present a burden to distributors, the rulemaking record indicates that such an approach is the most cost-effective way to ensure that the downstream employees are properly protected. The costs of the distribution of the MSDSs are ultimately borne by the downstream user obtaining the information. The recommendations of these distributors that they either be exempted, or allowed to respond to requests only, simply shift the burdens of compliance to other employers and create a less efficient system of information transmittal. In particular, OSHA believes that the distributors who wish to simply respond to requests are assuming that the number of requests will be minimal. As all downstream employers are now covered by the rule, this is not a realistic assumption. Every customer they have to which hazardous chemicals are supplied is required to have the MSDSs. If a distributor has to respond to multiple requests from, as one commenter testified (Tr. 3–43), 10,000 customers, the burden on both the requestors and the distributor will be significant.

OSHA specifically recalculated the costs for distributors to the nonmanufacturing sector to consider an ''on request'' system (Ex. 71–70). These cost figures reiterated the findings of the original cost analysis, *i.e.,* this is a more costly and less efficient way to distribute the information. Furthermore, as the downstream employers are not supposed to use a chemical without having the MSDS, it will cause them a delay in use of the product, or increase the probability that employees will be inadequately protected because employers will use the product without the MSDS. Clearly, downstream users are not as knowledgeable about the hazards of the chemical products as the manufacturers of those products. The best way to protect downstream employees is for OSHA to assure that complete hazard information is provided to the downstream employers and employees by the time they receive the chemical.

Other comments from these employers related to ideas for information to be included on more detailed labels, instead of MSDSs (Ex. 28), or other specific suggestions for modification of the distributor's duties (Ex. 22). These will be dealt with in the sections of the preamble covering labels and material safety data sheets.

Laboratory coverage. The current HCS limits coverage of laboratories (paragraph (b)(3)), simply requiring that labels be kept on containers that are received labeled; that material safety data sheets which are received be kept, and employees be given access to them; and that employees be trained in accordance with paragraph (h) of the rule. Paragraph(h)(2)(iii) states, among other things, that employees are to be informed of the location and availability of the written hazard communication program. Since laboratories are not required to have written hazard communication programs, this part of the information and training program would not apply to these types of facilities. Although this would appear to be evident, OSHA has received a number of questions regarding this, so the provision has been modified to clarify that the location and availability of the written hazard communication program does not have to be addressed in the laboratory training program. The location and availability of material safety data sheets, which is also currently addressed under paragraph (h)(2)(iii), would still have to be included in the training program.

Two other technical amendments have been made to clarify the laboratory provisions. In paragraph (b)(3)(iii), the current rule states that employees are to be ''apprised of the hazards of the chemicals in their workplaces in accordance with paragraph (h) of this section''. Paragraph (h) requires employers to provide employees with both information, (h)(2), and training, (h)(3), on hazardous chemicals in their work area. Some employers have misinterpreted the use of the word ''apprised'' in (b)(3)(iii) as only requiring hazard information transmittal and not training. Clearly the intent of referencing paragraph (h) in paragraph (b)(3)(iii) was to require employers to ''fully implement the training provisions of the hazard communication standard for laboratory employees.'' 48 FR 53288. Paragraph (b)(3)(iii), therefore, has been clarified to indicate that laboratory employees must be provided both information and training in accordance with paragraph (h).

Another recurring question involves a laboratory's responsibilities as a chemical manufacturer or distributor. The limited provisions of paragraph (b)(3) are directed to an employer's duties to laboratory employees. They do not, in current form, affect such an employer's duties once the material is being packaged and shipped elsewhere. At that point, the parts of the standard that deal with distribution of chemicals apply. In order to reiterate those requirements, OSHA has adopted a technical amendment to clarify a laboratory's duties when shipping or transferring a chemical out of the laboratory. In this situation, a laboratory would be a chemical manufacturer or distributor, and would have to evaluate the chemical's hazards under paragraph (d) and label containers and provide material safety data sheets in accordance with the rule if the chemical is determined to be hazardous. This would include samples sent to another laboratory. It must be reemphasized, however, that the HCS is based upon currently available information. If a new chemical is developed, and it has not been tested to determine its hazardous effects, then there is no information to transmit. The rule does not require testing of chemicals to be performed.

One commenter has suggested that laboratories be treated the same as any other workplace in terms of protection (Ex. 11–125). OSHA believes that the feasibility and practicality concerns of laboratories warrant the approach taken (see 52 FR 31861; 48 FR 53287–89 for further discussion).

With regard to laboratories, it should also be noted that OSHA has finalized a specific rulemaking to address Occupational Exposure to Toxic Substances in Laboratories (29 CFR 1910.1450). Some interested commenters in both rulemakings were concerned about potential duplication or conflict in the requirements of the HCS versus the laboratory standard. The Agency drafted the final laboratory standard in a manner that does not conflict with or duplicate the requirements of the HCS.

Coverage of operations involving sealed containers. The 1987 rule included limited coverage for work operations where employees only handle chemicals in sealed containers, *i.e.,* they are not opened in the workplace under normal conditions of use (paragraph (b)(4)). No changes were proposed for the provision when the NPRM was published. However, OSHA is making a minor technical amendment in this final rule. The provision as promulgated requires employers to request an MSDS for chemicals received without one when employees want to have access to the MSDS. There was no time frame included in the rule for this request process. In this final rule, OSHA has clarified that the request is to be made as soon as possible. OSHA has generally interpreted this to mean within 24 hours. This is consistent with the requirement in (g)(6)(iii) for an employer or distributor to obtain an MSDS as soon as possible when one has

not been provided with a shipment of a hazardous chemical.

There were comments received which asked for clarifications of the sealed container exemption. In particular, commenters questioned whether the training requirements of the sealed container provisions apply to retail establishments selling consumer products. Exs. 11–11 and 11–93. For those consumer products that are not otherwise completely exempted (*i.e.,* food, drugs, cosmetics packaged for sale to consumers in a retail establishment), training would apply under the rule. OSHA believes that the limited nature of the requirements are minimally burdensome to these types of employers, but that workers need to be told what to do in the event of a spill or leak in this situation. The large quantities of materials present pose a different potential exposure situation than there would be in a home where consumers generally have smaller quantities stored. The training can be directed to the various types of hazards, and need not be on the specific chemicals.

Labeling exemptions. Following publication of the 1987 final rule, the Department of Agriculture (Ex. 5–28) and the Animal Health Institute (Ex. 5–37) requested that a specific exemption be included for labeling of veterinary biological products. Although these materials are considered to be drugs, the Federal Food, Drug, and Cosmetic Act (FDCA), 21 U.S.C. 392(b) ''defers'' regulation of some veterinary biologics to the Department of Agriculture when the biologics are subject to the Virus-Serum-Toxin Act of 1913, 21 U.S.C. 151 *et seq.*

To the extent that the hazards of these materials are biological hazards, the HCS would not apply in any event. However, there are apparently some chemicals used in the materials that would potentially be covered by the HCS (in particular, formaldehyde). OSHA has added an exemption for labeling of these items when they are subject to the labeling requirements of either the Food and Drug Administration or the Department of Agriculture. A number of commenters supported this clarification (Exs. 11–48, 11–60, 11–76, 11–89, 11–101, and 11–134), and no one objected. It should be noted, however, that this exemption is just for labeling, and to the extent chemical hazards are present in these materials, the other provisions of the HCS would apply in terms of employee protection.

An additional comment (Ex. 11–119) suggested that a similar labeling exemption be incorporated for seeds that are labeled in accordance with the Federal Seed Act administered by the U.S. Department of Agriculture. OSHA agrees, and has added such an exemption to this final rule.

OSHA has also added an exemption for additional labeling of chemical substances or mixtures that are labeled in accordance with the requirements of EPA under the Toxic Substances Control Act (TSCA). EPA has labeling authority for such products under TSCA, and has adopted some labeling requirements for specific substances. These specific labeling requirements would apply.

Other Exemptions

Hazardous waste. The existing HCS includes a total exemption for hazardous waste when regulated by EPA under the Resource Conservation and Recovery Act (RCRA). However, the rule does not mention hazardous waste regulated by EPA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In order to ensure that coverage of the rule is consistently applied, this exemption has been modified to include hazardous substances regulated by EPA under CERCLA.

Wood dust. In the preamble to the revised final rule, OSHA clarified that the wood and wood products exemption did not apply to ''wood dust.'' Wood dust is not generally a wood ''product,'' but is created as a byproduct during manufacturing operations involving sawing, sanding, and shaping of wood. Wood dust does not share solid wood products' ''self-evident'' hazard characteristics that supported the exemption of wood products from the HCS' coverage. Except for the chemical additives present in the wood, products such as lumber, plywood, and paper are easily recognizable in the workplace and pose a risk of fire that is obvious and well-known to the employees working with them. The potential for exposure to wood dust within the workplace, especially with regard to respirable particles, is not self-evident, nor are its hazards through inhalation so well-known that hazard communication programs are unnecessary.

OSHA is technically amending the rule to clarify that the wood and wood products exemption, paragraph (b)(6)(iv), only applies to wood or wood products for which the chemical manufacturer or importer can show that the hazard potential is limited to its flammability or combustibility, and therefore the other hazards of wood dust or other chemicals that may be emitted from treated wood would be covered. Lumber which will not be processed is exempted. Although this has been the Agency's enforcement policy, there have been commenters who suggested that the rule itself should be clarified (Exs. 2–104 and 2–105).

OSHA recognizes that there are some practical questions regarding the appropriate application of the HCS requirements to wood dust. First, it is obvious that exposure can only occur when the dust is generated in airborne concentrations, in a particle size that can be inhaled by people working in the area, such as sanding, sawing, or grinding operations. (See, *e.g.,* Ex. 2–211). The rule should not be interpreted as requiring hazard communication programs for wood mulch, which is typically made up of rather large pieces of wood, and not processed downstream, or trace quantities of wood dust on boards that have been cut. Secondly, it is also obvious that wood dust cannot be labeled in these work situations since it is not ''contained.'' Work areas could be placarded with the hazard information to provide an immediate visual warning for workers involved in these types of operations. The inability to label in some situations, however, does not negate the need for a material safety data sheet and training on the hazards and the available means of protection, and these, and all other HCS requirements, would still apply.

The question of who should be responsible for generation of the material safety data sheet is one which is more difficult to answer. Several commenters suggested that the generator of the dust in a particular operation (*e.g.,* furniture manufacturing) should be responsible, not the producer of the wood product (*e.g.,* a logging company) (Exs. 2–68, 2–104, 2–138, and 2–211). In this situation, as well as similar situations with grain and other products which are grown rather than produced, OSHA believes it is appropriate to place the responsibility for development of the MSDS on the first employer who handles or processes the raw material in such a way that the hazardous chemical is ''produced'' and released into the work environment. For wood, although some dust would be produced when the tree is felled, it appears that the duty would most appropriately fall on the sawmill, which is a manufacturing operation (SIC Codes 24 and 26). For grain dust, it would be the grain elevator. Data sheets would thus have to be provided to the workers in these facilities exposed to the hazards, and where these types of operations distribute the product in a form where the hazard will be generated under further processing (*e.g.* the sawmill sells

boards to a furniture manufacturing facility), then the material safety data sheet must be transmitted downstream as well.

Articles. As discussed at length in the NPRM preamble (53 FR 29828–33), OSHA believes that the definition of an exempted ''article'' which was promulgated under the original final rule in 1983 is still appropriate, but proposed a minor modification to clarify the definition to be consistent with Agency interpretations.

The current definition of ''article'' is as follows:

''Article'' means a manufactured item: (i) Which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use.

The new definition will read as follows:

''Article'' means a manufactured item, other than a fluid or a particle: (i) Which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts, of a hazardous chemical (as determined under paragraph (d) of this section) and does not pose a physical hazard or health risk to employees.

The new definition differs from the current one in that it includes as articles items which release not more than very small quantities—e.g., minute or trace amounts—of a hazardous chemical, as long as these items do not pose a physical hazard or health risk to employees. This definition gives manufacturers and importers more latitude in determining whether an item is covered under the HCS, as the current definition requires that to be considered an article, an item not release any amount of a hazardous chemical. The proposed definition also makes clear that fluids and particles are not articles; this is not a change in the definition, but simply articulates this fact for the sake of clarity.

Many of the commenters on the proposed revision supported the changes (see, *e.g.,* Exs. 11–1, 11–11, 11–40, 11–48, 11–50, 11–51, 11–54, 11–86, 11–90, 11–111, and 11–133). Some commenters did not believe that a revision was necessary in any event: '' * * * [W]e believe that the definition of the term 'article' is in danger of overelaboration. The extant definition is sufficient. The proposed version, while becoming wordier, would still be acceptable.'' Ex. 11–10. See also Ex. 11–136. OSHA has concluded that the additional language as proposed is necessary in order to give employers more complete information on what an exempted article is, and is adopting the proposed modifications in this final rule.

As the Agency indicated in the NPRM discussion, the definition has been in place since 1983, and chemical manufacturers and importers have been successfully applying it to their products since that time. There appear to have been few citations issued regarding inappropriate application of the article exemption. The rulemaking participants objecting to the definition have couched their objections in terms of difficulties in applying the requirements of the rule. However, OSHA believes, and the record accumulated since the NPRM was published continues to support this belief, that the true objection is to the coverage of specific products, not to whether the definition can be applied as written. Producers of these types of products clearly can determine that they are not articles under the HCS, and thus the requirements of the rule apply. Their objections, therefore, are to coverage under the rule.

OSHA discussed this issue at length in the NPRM. As indicated at that time, the primary participants regarding this issue are The Formaldehyde Institute (Ex. 11–37, 11–140, Ex. 86), and representatives of other organizations associated with formaldehyde-treated products (see, *e.g.,* National Particleboard Association (Ex. 11–137, Ex. 74); National Cotton Council (Ex. 58, Tr. 7–183–91, Ex. 91)). It should be noted that both the Formaldehyde Institute and the National Particleboard Association submitted notices of intent to appear at the informal public hearings, but withdrew prior to presenting their testimony. Furthermore, although their post-hearing exhibits have been entered into the record, as a procedural matter, organizations not participating in the hearing are not allowed to file post-hearing exhibits. In addition, the National Cotton Council was permitted to testify the last day of the hearing, but had not submitted a notice of intent to appear. Consequently, testimony was not available prior to the hearing to enable OSHA and other interested parties to prepare questions on it. The National Cotton Council submitted a post-hearing exhibit March 23 (8 days after the period for submission of briefs was concluded). Since this submission was not a brief, it should have been submitted by February 13, the date for hearing participants to present additional information.

OSHA is not going to repeat all of the discussion regarding the Agency's interpretation of the rule's requirements. (*See* 53 FR 29828–33.) The formaldehyde-related commenters have attempted to use that discussion to argue that OSHA's position on articles is inconsistent with other parts of the rule or with Agency interpretations. This simply is not the case, and the discussion stands as the Agency's position.

The rule cannot credibly be interpreted as not covering the products these commenters are discussing. In particular, in the original final rule, OSHA indicated that the definition of article was specifically worded in the fashion it was to address problems with such products as these commenters are concerned about: ''For example, the ACTWU (Ex. 111) described a situation involving fabrics in common use which are treated with permanent press resins which release formaldehyde when handled. Workers engaged in making clothing from such fabrics should be informed about the nature and identity of their formaldehyde exposures * * *. Therefore, the definition has been modified to ensure that in this type of situation, hazard information is transmitted to employees and downstream employers.'' 48 FR 53293. Commenters' arguments that their professional judgment allowed them to determine that downstream risks are negligible are completely contrary to the rule as written. Professional judgment comes into play only with regard to the weight of the evidence substantiating a hazard, not with regard to predicting downstream exposures.

As OSHA noted in the NPRM, the definition of an article and application of that definition to determine whether an item is exempted, is an issue for chemical manufacturers and importers, not non-manufacturers. Non-manufacturers have no responsibility for applying the definition, and can rely on the evaluations performed by their suppliers. One commenter took issue with this statement (Ex. 11–111), and indicated that non-manufacturing is concerned about articles as well. Some of these commenters supported the position that the article definition should be narrowed so as to result in fewer products being covered in non-manufacturing workplaces (see, e.g., Ex. 11–135, 11–142). That is a different issue than claiming that the definition itself is unworkable, and OSHA is reiterating that application of the definition to manufactured items is an issue that is solely the concern of

manufacturers. Therefore, opinions expressed by these non-manufacturers who have no experience applying the definition, and have no responsibility to do so, are irrelevant as to whether the definition should be revised.

The primary alternative suggested by representatives of the formaldehyde industry commenters is that OSHA exempt *de minimis* releases so that a manufactured item which releases ''small'' amounts of a hazardous chemical during normal conditions of use is still considered an article and not covered by the HCS. (See, *e.g.,* Exs. 11–37, 11–107, 11–122, 11–127, 11–135, 11–137, 11–140, 11–142, 11–146, and 11–154) (six of these commenters are formaldehyde-related organizations; two are construction representatives who do not have to apply the definition; one is a mining industry representative that is not covered by OSHA). Several commenters indicated that the changes were a step in the right direction, but did not go far enough (Exs. 11–38, 11–137, and 11–147).

As indicated in the NPRM, this alternative simply does not provide sufficient protection for employees, and does not address the true issue of concern—the exposure of employees. Manufacturers and importers often cannot accurately predict downstream exposures to a hazardous chemical, and individual reactions to an exposure vary. The purpose of this standard, therefore, is to provide information on all hazardous chemicals to which employees could be exposed.

No new arguments have been presented by these rulemaking participants, and as discussed in the NPRM, the existing arguments are not persuasive. As a result of comments these same participants and others have made in the formaldehyde docket, the hazard communication provisions of the formaldehyde rule were stayed repeatedly, and the HCS was applied to those products. As OSHA had indicated in the NPRM, the 0.1 ppm cut-off that applied in the formaldehyde standard was a de-regulatory provision—it resulted in the hazard communication provisions of that rule applying to fewer products than would be covered under the HCS. As far as OSHA is concerned, the specific formaldehyde rulemaking addressed the concerns of the industry producing such products by establishing a substance-specific *de minimis* cut-off for formaldehyde. That cut-off was then stayed at the request of the industry representatives. The Agency does not believe it is appropriate to revise the generic HCS rule to address the specific situation with regard to formaldehyde.

OSHA recently published a new final rule on formaldehyde which revised the substance-specific hazard communication provisions (57 FR 22290; May 27, 1992). The requirements of this specific standard with regard to hazard communication now supercede the generic HCS provisions. As these new provisions address the unique concerns of the formaldehyde-related industries, OSHA does not believe those industries' concerns need be dealt with further in this rulemaking proceeding with regard to the article definition. As noted in the formaldehyde preamble (57 FR 22297–98), nothing in the formaldehyde rule should be considered to be precedent-setting with regard to hazard communication. It was a unique situation that was handled on an individual basis and does not apply to the generic provisions of the HCS.

Several commenters suggested that the mixture rule should be applied to the entire article, including the chemicals that are bound inextricably and to which employees are not exposed (Exs. 11–122, 11–127, 11–137, and 11–140). As OSHA described in the NPRM, this is inappropriate and irrelevant to employee exposures. The weight or volume of a gas present in a solid material is totally unrelated to what is released—in the situation of the formaldehyde-contaminated products, the gas is 100% of the release even though the relative weight or volume would be far less than the percentages indicated. Two other commenters indicated they did not agree with the discussion regarding mixtures (Exs. 11–86, 11–137)—however, the discussion merely describes what the standard already requires. One commenter suggested that the definition be clarified to indicate that the hazard determination is to be done on the release. Ex. 11–147. The definition already refers to paragraph (d) with regard to the release, and the overall scope of the standard is limited to exposures which occur when chemicals are released.

Other commenters indicated that OSHA should emphasize that manufacturers do not have to consider misuse when determining if their product is an article. Exs. 11–11, 11–111. (Another commenter indicated that the definition should cover abnormal conditions of use as well as normal. Ex. 11–125.) The definition does not mention misuse, and certainly that is not a factor in the manufacturer's decision. It also does not apply to the ultimate destruction of the product, *e.g.,* materials emitted when plastics are incinerated. Chemical manufacturers and importers do have to consider any intermediate uses prior to the final use, *i.e.*, whether installation or finishing of the item results in employee exposures (Ex. 11–21). The ACCSH recommendations suggested that the definition list some of these types of operations that would be covered (such as welding). OSHA does not think that is necessary, and as has already been stated, the definition is in danger of becoming too detailed. Therefore, we reiterate again that the exemption applies to the end use of the product only—if intermediate uses result in exposures, they are covered under the rule.

A number of other comments were also received. One suggestion (Ex. 11–51) was that further consideration should be given to exempting those amounts not known to cause adverse health effects. Similar to the arguments regarding *de minimis* cut-offs, this suggestion presumes a ''bright line'' determination of when risks will occur and knowledge of downstream exposures. This approach is not consistent with the intent of the HCS to prevent effects from occurring by providing information prior to putting the employee at risk.

It was also suggested that for polymers, the primary concern should be what employees are exposed to, not simply the constituents (Ex. 11–51). This is true for all articles, and is the approach OSHA has adopted.

One commenter indicated that most medical devices are articles (Ex. 11–107)—OSHA agrees that this is probably true, since medical devices include such items as crutches, etc. Where this is not true and hazardous chemicals are not completely bound up in the medical device, it would not be an article. It was also noted that trace amounts will be difficult to determine (Ex. 11–122).

Another commenter stated that adding the exemption for fluids and particles confused the issue, and it should be deleted (Ex. 11–108). OSHA does not agree. Fluids and particles never met the definition in the exemption anyway, and stating that explicitly ensures the definition is interpreted correctly and is consistent with EPA's definition of an article.

However, as has been discussed previously, it is not appropriate to adopt all of EPA's definition since it does not adequately address worker exposures (Ex. 11–135), nor is it appropriate to exempt exposures below the PEL (many chemicals do not have PELs, and the manufacturers cannot predict what downstream exposures will be (Ex. 11–122)). Similarly, an action level or percentage of PEL as a trigger is not appropriate for an information

transmittal standard, and will not work as the majority of chemicals do not have PELs (Exs. 11–127, 11–131).

One commenter was under the impression that the change in definition would result in hundreds of products in the printing industry being covered that weren't covered under the original rule (Ex. 11–162). This is inexplicable to OSHA since the revised definition was simply a clarification of the requirements, not a change in the provision.

The National Electrical Manufacturers Association (Ex. 24) submitted examples of electrical brushes to the record, and was concerned about a court decision involving such products. It should be noted that decisions concerning the applicability of the rule to items such as electrical brushes are to be made on a case-by-case basis by the chemical manufacturer or importer in the hazard determination process. It is entirely possible that electrical brushes from different manufacturers would be treated differently under the rule, depending upon their specific characteristics. The brushes of concern in the court case released copper and graphite dust as a result of handling, and employees were exposed. It is conceivable that other brushes would not be capable of releasing such materials when handled, and thus would not be covered.

OSHA concludes that no further change in the definition is warranted based on the information submitted to the record. In fact, the information is not new, and simply repeats the arguments previously presented and rejected by OSHA in the NPRM.

Food, drugs, cosmetics, and alcoholic beverages. For ease of reference, OSHA has reorganized these exemptions in this final rule and separated them by topic (*i.e.*, there is a specific subparagraph dealing with food and alcoholic beverages, another with drugs, and a third with cosmetics).

In the 1987 revised final rule, OSHA included an exemption for food, drugs, cosmetics, or alcoholic beverages in a retail establishment which are packaged for sale to consumers (paragraph (b)(6)(v)). This exemption recognized that even where these chemicals are hazardous (and many are not, particularly in the area of food items), they present little or no hazard to employees when they are in final packaged form for sale to consumers. This exemption effectively limited coverage of many retail establishments which only have hazardous chemicals in this form, *i.e.,* packaged for sale to consumers. But it did not exempt these products when they are being used in a retail establishment and thus exposing employees.

As previously stated in the preamble to the revised final rule, if a product is exempted downstream, a distributor has no responsibility for providing a MSDS on that product to the retail distributor. ''In addition, since these products are exempted, employers which package them for retail sale would not have to furnish material safety data sheets to distributors receiving the products.'' 52 FR 31862. Several commenters suggested that wholesale distributors be exempted (Ex. 11–39), or that the packaged materials be exempted at the wholesale level as well (Exs. 11–111, 11–117, 11–158). OSHA disagrees. The large volume of chemicals handled in these types of workplaces, and the fact that they may readily spill or leak, poses a risk to the distributors' employees. Their coverage, however, is already limited by the sealed container provisions (paragraph (b)(4)) of the rule to maintaining information received, and training workers with particular emphasis on handling spills and leaks. This approach minimizes the burdens of coverage, while providing adequate protection for employees who only handle these chemicals in sealed containers.

Food. OSHA proposed a further modification to this exemption to both clarify and extend it to other food and alcoholic beverage products in retail establishments that are being prepared for consumption by consumers. Thus food used for cooking meals to be sold to customers would be exempt, as would alcoholic beverages which are sold by the glass and thus prepared for consumption rather than ''packaged'' for consumer use. Although OSHA believes that most such products in terms of food items would not be hazardous under the rule in any event, it appears that some manufacturers are nevertheless providing material safety data sheets for such items as aflatoxin in peanut butter used in a restaurant. To ensure such interpretations are not made, and that material safety data sheets are not unnecessarily being provided for such items, OSHA proposed this modification to the exemption and invited comment on the proposed language.

Comments supporting this exemption were received (Exs. 11–25, 11–88, 11–113, and 11–117), although it was suggested that no differentiation be made between packaged and unpackaged food in this exemption (*e.g.,* bulk food shipments) (Exs. 11–25 and 11–115). No comments were received that objected to the proposed exemption. One commenter suggested that food be totally exempted (11–115), but food can be a hazardous chemical at some stages of production (*e.g.,* flour dust causes baker's asthma). It was also suggested that it be clarified that beverages other than those that are alcoholic are considered to be food. This appears to OSHA to be self-evident.

To accommodate the concerns raised, OSHA has re-drafted the exemption pertaining to food and alcoholic beverages as follows:

''Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees.''

Drugs. The original HCS covered the manufacture and formulation of drugs in the manufacturing sector. The rule included a labeling exemption for such products when they were labeled in accordance with the regulations of the Food and Drug Administration (FDA), but all other aspects of the program were applicable to the drug products as well as those chemicals used to make them. In preparing the revised final rule, OSHA determined that it is not necessary to cover such drugs in the non-manufacturing sector when they are in a form that is not likely to result in exposure to employees. Thus the rule totally exempted drugs when they are in a retail establishment (*i.e.*, a drug store or a pharmacy) and are pre-packaged for sale to a consumer (paragraph (b)(6)(v)). Therefore all over-the-counter drugs were exempted at the retail level (thus wholesale distributors did not have to send MSDSs to the retail facilities), and many prescription drugs were exempted at the retail level as well since they are packaged prior to reaching the retail establishment. In addition, OSHA included an exemption for drugs in solid, final form (*e.g.,* pills, tablets, capsules) for direct administration to a patient. As mentioned previously, this was based on the Agency's determination that the potential for exposure is minimal from drugs in these forms.

However, in recognition of the fact that there are various types of workers who may be exposed to drugs in hospitals or pharmacies (*e.g.*, nurses, nurses' aides, pharmacy aides, janitors, or technicians), OSHA did not exempt those drugs that are not solid or are not pre-packaged for sale to consumers (a pharmacy in a hospital would be considered to be a retail sale establishment for purposes of the exemption as written). What remains under this approach are primarily powder, aerosol, or liquid prescription drugs. (An industry representative

admitted in response to questions during the hearing that these exemptions eliminated coverage of 75% of drug products and that industry estimates of cost did not take these exemptions into account (Tr. 3–94–95)). Thus nurses required to mix anti-neoplastic drugs, for example, or janitors cleaning up spills, would be entitled to a material safety data sheet and training under the revised final rule.

There was little discussion of the drug issue in the record prior to the revised final rule (see, *e.g.*, Ex. 2–176). However, since drugs are designed to be biologically active, OSHA wants to ensure that employees will be properly protected. As an example of potential problems, OSHA cited a report in the American Industrial Hygiene Association Journal (Ex. 4–59) that described one hospital's experience with a drug that is generated as an aerosol in a tent for administration to children. Nurses, respiratory therapists, doctors, and other employees are directly exposed when they enter the tent to care for the patients. Information on the drug indicates that such occupational exposure may result in carcinogenesis, fertility impairment, and fetotoxicity. In addition, however, employees who were exposed also complained of experiencing acute effects such as headaches, burning and dryness of the eyes, coughing and dryness of the upper respiratory tract. The hospital eventually devised a protective program for exposed employees based upon its experiences. A MSDS with recommendations for protective measures may have helped them resolve the situation prior to employees being exposed.

In response to the approach taken in the revised final rule, the National Wholesale Druggists' Association (NWDA) (Ex. 5–85) recommended that OSHA recognize package inserts approved under FDA regulations as an acceptable alternative to material safety data sheets required under the rule. Additionally, the NWDA suggested that the Physicians' Desk Reference, a privately developed reference regarding drugs, also be considered to be an alternative to requiring MSDSs for drugs approved by FDA. Other commenters recommended that all prescription drugs be exempted since they are adequately covered by FDA labels, other available resources, and the medical training of persons handling or supervising handling of the drugs (Exs. 5–77 and 5–102).

Although the purpose of the Federal Food, Drug, and Cosmetic Act administered by the FDA is to protect consumers of such products and the general public (see, *e.g.*, *Pharmaceutical Mfrs* v. *FDA*, 484 F. Supp. 1179, 1183 (D.Del. 1980)), the product data inserts that accompany pharmaceuticals do contain some information that is analogous to that found on MSDSs and would provide some protection for employees. In particular, at 21 CFR 201.100(d)(1), FDA requires that inserts for prescription drugs for human use must contain the following information:

> Adequate information for such use, including indications, effects, dosages, routes, methods, and frequency and duration of administration and any relevant warnings, hazards, contraindications, side effects, and precautions, under which practitioners licensed by law to administer the drug can use the drug safely and for the purposes for which it is intended * * * [in] the same [ ] language and emphasis as labeling approved or permitted * * *.

This would be useful chemical hazard information for employees involved in administering the products even though employee protection is not the primary purpose of the information presented.

In addition to publication of such information in the package inserts themselves, the FDA regulations also state that (21 CFR 202.1(l)(2)):

> [R]eferences published (*for example*, the ''Physicians' Desk Reference'') for use by medical practitioners, pharmacists, or nurses, containing drug information supplied by the manufacturer, packer, or distributor of the drug and which are disseminated by or on behalf of its manufacturer, packer, or distributor are hereby determined to be labeling as defined [by] the Act.''

According to the Physicians' Desk Reference (PDR) in its Forward (40th ed. 1986), ''drug information'' in the PDR is ''prepared by manufacturers, edited and approved by their medical department and/or medical consultant.'' PDR publishes the information verbatim. *Id.*

OSHA proposed to modify the definition of ''material safety data sheet'' under the rule to indicate that a package insert approved by FDA, or an entry in the PDR prepared in accordance with FDA's requirements, be considered in compliance with the HCS requirements for a MSDS for these products. In addition, the exemption regarding solid drugs was corrected to read ''*e.g.,* tablets or pills'' rather than ''*i.e.*'' as is currently indicated in the revised final rule (see, *e.g.*, Exs. 5–77, 5–85, and 5–102).

The Agency invited comment on this issue, particularly from employees who would be affected by the modification to ensure that they agree that this information is adequate for their protection. The existing exemption for labeling would remain in effect, employers would still have to have hazard communication programs where covered, and training would have to be given to those employees who have not previously been trained regarding the hazards and protective measures.

Industry representatives consistently supported the use of alternatives to MSDSs for drugs (see, *e.g.*, Ex. 11–42, 11–60, 11–108, 11–115, and 11–153), or further thought that a full exemption from all requirements was warranted (*e.g.*, Exs. 11–54, 11–59, 11–75, 11–120, and 11–138) or that drugs should be exempted when handled by wholesalers (Ex. 11–158). ''Applying the Hazard Communication Standard to drugs that are either aerosol, mist, or liquid and for patient use seems both impractical and questionable. To begin with, if these drugs are being handled by nurses or doctors, they are being handled by professionals trained to dispense medication.'' Ex. 11–120. It was also suggested that the exemption be further extended to manufacturing (Ex. 11–48), and that other alternative information sources be permitted in addition to those indicated in the proposal (Exs. 11–92, 11–108, and 11–138).

Additionally, some of these commenters suggested that other items regulated by FDA (such as medical and dental devices) should also be allowed to be accompanied by package inserts instead of MSDSs (Exs. 11–48, 11–96, and 11–108).

It was also suggested that other information comparable to the PDR should be permitted (Exs. 11–92, 11–108, and 11–138), and it was noted that FDA does not actually approve package inserts, they are just issued in compliance with the law, and therefore the OSHA rule should not refer to approved inserts (Ex. 11–48).

Another commenter suggested that the PDR be permitted to be used, but that the entries be modified to include safety information for workers (Ex. 11–62). It was also confirmed that training needs to be provided for proper handling of drugs (Ex. 11–92), so a total exemption would not be appropriate. However, one commenter suggested that OSHA could rely on ''voluntary'' training (Ex. 11–120).

On the other hand, a number of commenters indicated that package inserts and PDR entries are not acceptable alternatives to MSDSs (Exs. 11–7, 11–21, 11–69, 11–103, 11–125, and 11–144). Concerns expressed by these commenters included the fact that the information on the package inserts and PDR entries is not clear or easily understood, and the information is not comparable to that included on MSDSs.

For example, the American Nurses' Association and the American Association of Critical-Care Nurses (Ex. 11–69) objected to allowing alternatives to MSDSs for drugs. ''The use of such inserts or entries has not historically been for occupational exposure alerts * * * Additionally, they are usually in minute print and contain voluminous patient response and safety information. This would negate the effect of a hazard alert to employees.'' The ANA and AACN indicated that nurses are experiencing significant exposure potentials to many different types of drugs: ''Increasingly, nurses have to mix patients' intravenous medications on holidays, evening, night and weekend shifts because there is no pharmacist in the facility. Likewise, nurses have had to perform housekeeping duties, cleaning equipment, and disinfecting patient areas after waste spills * * * Technological advances in pharmaceuticals used to medicate patients and for medical treatment could increase nurse exposures to drugs that are harmful outside of the pharmacy preparation area.''

Similarly, the American Federation of State, County and Municipal Employees (Ex. 11–144) stated: ''Workers may receive significant and hazardous exposure to drugs in the course of manufacturing, preparing, or administering those drugs. For example, hospital personnel who prepare and administer cytotoxic drugs have been shown to experience both short-term health effects (such as dizziness, nausea, headache, lightheadedness, allergic reactions), and chronic effects (including cancer, leukemia, birth defects, miscarriages, and chromosomal damage). Waste anesthetic gases, such as nitrous oxide, have caused nausea, dizziness, headaches, fatigue, and irritability, as well as sterility, miscarriages, birth defects, cancer, and liver and kidney disease, among operating room staff and/or their spouses (in the case of miscarriages and birth defects).'' AFSCME also noted that PDR entries and package inserts do not include the following information that MSDSs would: Exposure limits, physical hazards, routes of exposure, health hazard data related to worker exposure, control measures, and procedures for safe handling and use.

OSHA has decided not to adopt the proposed modification in the final rule. It is clear from the comments of worker representatives and others that the proposed alternative does not provide adequate information, and is not as effective as having MSDSs.

Although the National Wholesale Druggists Association has provided estimates of extensive burdens that would be caused by coverage of the non-solid, prescription drugs in the non-manufacturing industries, their numbers are not credible. As mentioned previously, even assuming that their unit costs are correct, their burden estimates do not take into account the existing exemptions in the rule. For example, at a Congressional hearing (Ex. 4–198) the NWDA distributed two MSDSs for toothpaste and an over-the-counter stomach remedy to illustrate the types of information they had to distribute. In fact, the MSDS for the toothpaste clearly indicated that the chemical was not hazardous under the HCS—so it was not covered and distribution of the MSDS was not necessary. The stomach remedy was combustible—a concern in the manufacturing facility. However, it too is exempt in terms of MSDS distribution once it is packaged for sale to a consumer. Thus NWDA members are not required to send MSDSs downstream for either of these products.

NWDA estimated that compliance with the rule would cost their industry $59 trillion dollars (Exs. 5–76 at p. 175), although at the same time they reported total sales of pharmaceutical products to be about $13 billion a year. More recent estimates varied from $1.8 million per facility to $16 million per facility (Tr. 3–94–95; Ex. 82). These figures are grossly exaggerated, and are based on incorrect assumptions such as having an MSDS included with every package instead of provided once with the initial shipment, or providing copies of every MSDS in a product line to every customer whether they purchase the product or not. OSHA does not find NWDA's arguments to be credible, nor do we believe that it is infeasible to distribute MSDSs for drugs that are not already exempted elsewhere. Proper protection of the workers exposed to these chemicals warrants the burdens imposed.

OSHA also raised another issue of concern regarding labeling of drugs dispensed by a pharmacist to a nurse who gives it to the patient. It is our understanding that these dispensed drugs may not be marked in any way, and since the nurse doesn't transfer the material from the labeled container, the portable container exemption for labeling would not apply. OSHA invited comment on suggestions for dealing with this issue for non-solid drugs. One commenter suggested that each facility should develop an appropriate method for dealing with the issue in conjunction with a training program (Ex. 11–92). The other indicated that dispensed drugs do not need to be labeled (Ex. 11–96). A third suggested that although the commenting organization supported such labeling, it appeared to be more beneficial to the patient than to health care workers (Ex. 11–69). OSHA has decided that the containers of drugs dispensed by a pharmacist to a health care provider to give to a patient will be considered to be exempted under the portable container provisions of the rule. This exemption has been added to paragraph (f)(7). Although the employee administering the drugs may not be the person performing the transfer, it appears that the necessary information is readily accessible to them, and that labeling the individual containers is not necessary in this situation.

Cosmetics. OSHA has separated the exemptions applying to cosmetics and placed them in a new subparagraph, but has not changed the substance of the requirements. Cosmetics are exempt when packaged for sale to consumers in a retail establishment, and when brought into the workplace for employee consumption. Otherwise, they are covered by the rule when they contain hazardous chemicals.

Consumer products. As described in the NPRM (53 FR 29834–38), one of the fundamental principles upon which the HCS is built is that employees are entitled to information regarding any chemical which is hazardous and to which they are potentially exposed. The type of use a hazardous chemical is intended for is irrelevant—the risk being addressed is exposure to a chemical without knowing what the hazards and appropriate protective measures are. That being the case, the 1982 NPRM contained no exemptions for any ''types'' of chemicals. The exemptions which were in the original final rule were based upon comments submitted to the rulemaking record after that proposal. OSHA limited the exemptions to situations where other regulatory programs addressed the problems involved (*e.g.*, labeling exemptions for those products labeled in accordance with another Federal agency's requirements), or where the hazards did not result from workplace exposure.

In the area of consumer products, the original final rule included an exemption for additional labels on such products when they are labeled in accordance with the requirements of the Consumer Product Safety Commission (CPSC). CPSC's requirements for labeling of hazardous substances are for the purpose of protecting consumers when such products are used in the home, the school, and recreational facilities (15 U.S.C. 2052(a)(1)). The Federal Hazardous Substances Act, 15 U.S.C. 1261 *et seq.*, and regulations issued under that Act by CPSC are not

designed to protect workers. See *American Petroleum Institute* v. *OSHA*, 581 F.2d 493, 510 (5th Cir. 1978), *aff'd on other grounds sub. nom. Industrial Union Dep't.* v. *American Petroleum Institute*, 448 U.S. 607 (1980).

Consumer products generally do not include the type of specific hazard information OSHA would require on the labels of containers of hazardous chemicals which are shipped. Although some consideration is given to chronic hazards, the basic emphasis is on acute effects. In addition, the labels focus on precautionary statements and routes of exposure rather than informing the user of the specific hazards. For example, a label for lead solder purchased in a hardware store indicates that it is ''fatal if swallowed'' and ''causes severe burns,'' but gives no indication of the fact that lead causes not only acute lead poisoning but also has severe effects on a number of body systems, including damage to blood-forming, nervous, and reproductive systems (see, OSHA's lead standard, 29 CFR 1910.1025). Furthermore, the primary route of entry for occupational exposure to lead would normally be inhalation—the consumer label does not indicate that inhalation of fumes generated when soldering is of concern. Ex. 4–71. Conversely, a properly prepared MSDS for the same material will indicate the full range of health effects, the appropriate protective measures, the fact that there is an OSHA standard for the material with a permissible exposure limit, and other useful information for both the employer and the employee being exposed.

Upon considering what information is necessary for the protection of workers exposed to these so-called consumer products in the workplace, OSHA decided that protection of workers would be served by allowing the CPSC labels to suffice, but requiring MSDSs and training as for any other hazardous chemicals. There appears to be some misconception that by virtue of being permitted to be marketed to consumers, consumer products are inherently safe and don't require any additional information be given to workers using them. This certainly is not the case.

As OSHA described at length in the NPRM preamble, the Consumer Product Safety Commission (CPSC), in its National Electronic Injury Surveillance System (NEISS), compiles estimates of product-associated injuries based on a statistically significant sample of incidents reported to institutions with emergency treatment departments. Information regarding work-related injuries treated in emergency rooms has subsequently been provided by CPSC to the National Institute for Occupational Safety and Health (NIOSH). See Ex. 4–77.

The NIOSH data indicate that a total of 136,212 work-related chemical injuries were estimated to have been treated in emergency rooms in 1986. As examples of the types of exposures responsible for these injuries, included in this total were chemicals and chemical compounds (solids, liquids, gases): 102,428; coal and petroleum products: 23,532; and soaps, detergents, cleaning compounds not classified elsewhere: 10,252. Thus OSHA has concluded that workers exposed to hazardous chemicals in consumer products are at a significant risk of experiencing adverse health effects. In particular, OSHA has determined that workers exposed to such chemicals by using the products in a manner not anticipated by the chemical manufacturer or importer, or using them in such a way that exposures are more substantial than those consumers would normally experience, need the protections of the HCS. For example, as NIOSH indicated in its comments, many paint thinners and paint removers available as consumer products contain organic solvents with toxic properties which could produce a hazard if used in large quantities and over an extended time period (Ex. 11–124).

Many products used industrially are also sold and used as consumer products. Thus exempting such products would be in essence exempting them because of the method of distribution for them, *i.e.*, that they are generally sold in retail establishments, rather than through wholesale distribution systems. This is not an appropriate rationale for such an exemption since it does not consider either workplace exposure potential or the hazardous nature of the chemical.

OSHA did not exempt consumer products from any provisions of the original final rule other than labeling. During the implementation of the original final rule, OSHA determined that its enforcement policy regarding consumer products would focus on the type and extent of usage (see, OSHA's instructions to compliance officers for enforcement of the HCS, Ex. 4–24):

> A common sense approach must be employed whenever a product is used in a manner similar to which it could be used by a consumer, thus resulting in levels of exposure comparable to consumer exposure. The frequency and duration of use should be considered. For example, it may not be necessary to have a data sheet for a can of cleanser used to clean the sink in an employee restroom. However, if such cleanser is used in large quantities to clean process equipment, it should be addressed in the Hazard Communication Program.

This appeared to OSHA to be a reasonable accommodation for employers who use consumer products in the manner intended, and with the same frequency and duration of exposure as would be experienced as consumers. The State of Maryland has implemented a similar exemption in its right-to-know law since 1985 (Ex. 11–21). They commented that the coverage of consumer products in this manner is necessary for the proper protection of employees, and employers in Maryland have been able to comply with the provision.

OSHA recognized that many more non-manufacturers would use consumer products than would be found in manufacturing facilities, and that the method of obtaining them might more likely be from retail distributors than wholesale. Thus the ANPR included questions regarding the use of such products, and the means of obtaining them. Relatively few responses were received. However, the responses did confirm that in many cases the use of consumer products in workplace operations has the potential to result in significant exposures that warrant more information being available than that which appears on a consumer product label (see, *e.g.*, Exs. 2–59, 2–83). OSHA decided to incorporate into the revised final rule its existing enforcement policy which was tied to type and extent of exposure (52 FR 31878; paragraph (b)(6)(vii)):

> Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*) and the Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*) respectively, where the employer can demonstrate it is used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure which is not greater than exposures experienced by consumers * * *.

OSHA further stated that this exemption ''strikes a balance between the practical considerations of acquiring and maintaining material safety data sheets on CPSC regulated products which employees are exposed to at home as well as at work, and the worker's need for more hazard information than a CPSC label when exposures are greater or more frequent than typical public use of the chemical would generate.'' 52 FR 31863.

There were some comments submitted on the coverage of consumer products following the publication of the revised final rule. A number of them felt that they could not define what

exposures in the workplace would be comparable to consumer exposure, and that the rule should exempt such exposures unless they are ''significantly'' greater than consumer exposure or that such products should be completely exempted (Exs. 5–53, 5–72, 5–88, 5–93, 5–94, and 5–97). As we have stated earlier, a common sense approach is required in making these determinations, and most employers we have dealt with clearly know whether the use of such products is unusual, of longer duration, or more frequent than home use. However, in the NPRM we invited further comment on the issue of adding the word ''significantly'' to the consumer product exemption to modify ''greater.'' A number of commenters supported this suggestion (see, *e.g.*, Exs. 11–51, 11–93, 11–104, 11–111, 11–115, 11–140, and 11–158). In some cases, however, this support was only endorsed as an alternative if the Agency did not agree to a broader exemption (see, *e.g.*, 11–111, 11–115).

Another suggestion submitted (Exs. 5–84, 5–93), and endorsed by OMB in its paperwork decision (Ex. 4–67), was to use the same consumer product exemption adopted by Congress in the community right-to-know provisions of the Superfund Amendments and Reauthorization Act (SARA) of 1986, Public Law 99–499 (Ex. 4–16), which is being implemented by the Environmental Protection Agency (EPA). The exemption would then be for ''any substance to the extent that it is used for personal, family, or household purposes, or is present in the same form and concentration as a product packaged for distribution and use by the general public.'' As OSHA noted in the NPRM, this exemption is not related to the extent of employee exposure to chemicals that are hazardous—which is the concern of OSHA in the HCS—and it is not appropriate for this rule. NIOSH also noted that ''consumer products'' are defined by EPA and OSHA for different purposes, and should not be summarily grouped together (Ex. 11–124).

The legislative history for SARA does not discuss the household or consumer product exemption. OSHA's rule preceded the SARA legislation, and it can be presumed that the exemptions in SARA were intended by Congress to address the different needs of community right-to-know versus worker right-to-know. Community right-to-know under SARA entails informing the general public and emergency response facilities about chemicals in their neighborhoods that could cause hazardous conditions during emergency situations. The HCS involves informing employees about the chemicals they are potentially exposed to on a day-to-day basis as a result of their work. The SARA exemption of consumer products was not a determination by Congress that such coverage is unnecessary in the workplace.

Nevertheless, a number of employer representatives supported such an exemption as appropriate for inclusion in the HCS (see, *e.g.*, Exs. 11–11, 11–74, 11–106, 11–127, 11–142, and 11–156), or simply suggested that consumer products not be covered (Ex. 11–9), or that CPSC labels provide enough protection (Exs. 11–82, 11–95). The arguments presented involve the desire for consistency with SARA (although the HCS provisions preceded SARA's), the perceived lack of need for additional information on such products, and concerns about interpreting the exemption as written. For example, the Texas Eastern Gas Pipeline Company (Ex. 11–128) stated: ''The significant difference between these two is that SARA III is a blanket consumer product exemption, whereas OSHA requires an employer demonstration to exempt an item. Our concern is the potential adverse interpretations of OSHA Field Compliance Officers and the required extent of any such demonstration by the employer.''

Obviously, a complete exemption is easier to comply with and enforce than a partial exemption. (Likewise, another option that would be easier to comply with and enforce would be to totally cover the products, rather than exempting any of them.) However, the issue of concern here is whether employees have sufficient information to be protected, not whether it would be less burdensome to completely exempt the products. A total exemption for consumer products would not adequately protect employees, and since the Agency has determined that these employees are at significant risk of experiencing adverse health effects if the workplace use of consumer products is not covered, then OSHA would not be meeting its statutory mandate.

Consistency with SARA requirements is not a persuasive argument either. Since EPA has adopted a permanent reporting threshold of 10,000 pounds for most hazardous chemicals (55 FR 30632), there will be many products covered in the workplace under the HCS that will not be reported under SARA. In fact, there will be many workplaces that will not be required to report anything under SARA that will nevertheless be covered under the HCS. In addition, although the Agencies have attempted to be consistent where possible, they nevertheless have different statutory mandates and purposes for regulation. OSHA's intent is to protect workers and provide them the right to know about the hazardous chemicals in their workplaces. This is quite different from reporting the presence of chemicals to local authorities for the purpose of emergency planning.

A number of commenters, particularly those who represented workers, were concerned about employee access to information about consumer products (see, *e.g.*, Exs. 11–51, 11–125, and 11–144). Some questioned whether the CPSC label should be permitted even when the product has an MSDS and there is training. For example, the National Institute for Occupational Safety and Health (NIOSH) (Ex. 11–124) stated: ''[M]any paint thinners and paint removers available as 'consumer products' contain organic solvents with toxic properties which could produce a hazard if used in large quantities and over an extended time period. The information reported for 'consumer products' does not offer the type of information needed to prevent hazardous exposure if used as an industrial chemical when extended exposure times are likely.''

Similarly, at testimony during the hearing representatives of workers in the construction industry expressed concern about coverage of consumer products: ''Now, the typical label says 'Use with adequate ventilation and don't ingest it', you know, don't eat it. That we do not think is adequate information for the use of a material on a construction site. Because, number one, we are not using it as Harry Homeowner, where he may be fixing one trap underneath the kitchen sink. Our people are using it every day, over a seven or eight hour period for 40 hours a week, for 52 weeks a year. That's a little bit different use.'' Tr. 6–106–7.

Other employee representatives addressed the appropriateness of the SARA exemption in a worker right-to-know standard: ''In our view, exclusion of consumer products as done under Title 3 really isn't appropriate under OSHA. Under OSHA the concern should be is the chemical hazardous, and what do we need to do with respect to information, not what is the source—does it come off a shelf of a retail distributor, or does it come directly from the manufacturer? And so we think OSHA's treatment in this area is really the appropriate one of looking at the hazardous nature of the chemical, and stemming from that, the information that must be provided to the employer and to the worker. So, we think that the

OSHA definition should be maintained.'' Tr. 7–47.

Representatives of the Chemical Manufacturers Association also agreed that consumer products should not be completely exempted (Tr. 7–24–6). Their members are producers of such products, and are required to prepare the MSDSs and distribute them.

OSHA believes that the record does not support excluding consumer products that are used in a manner different from normal consumer use, or are used more frequently, resulting in greater employee exposures. These chemicals present a hazard to workers that is not sufficiently mitigated by the CPSC-required labels. MSDSs and training are necessary to protect exposed employees. OSHA also does not believe that adding the word ''significantly'' to modify ''greater'' in the exemption resolves the problems employers have suggested will occur as a result of the exemption. In particular, if these employers believe they cannot determine when exposures are ''greater'' than that experienced by consumers (*i.e.,* it's too subjective), it's unclear how these same employers would be able to determine when the exposures are ''significantly'' greater.

We also believe that some of the employer objections were based on interpretations of the requirements that were more onerous than intended. For example, as was quoted above, there were some employers who felt that the employer would have to go to some great length to ''demonstrate'' that the use was a true consumer-type usage. To come within the exemption of this provision, an employer need only show that employee use of a consumer product containing hazardous chemicals is of a duration and frequency that clearly does not exceed what a reasonable person would concede to be normal consumer use in a home environment. (Generally, these types of objections were based on an assumption that OSHA's enforcement of the provision would be unreasonable. This certainly has not been the case in the manufacturing sector, and in any event, if a citation is issued unreasonably, existing options are available in the form of employer contest to the citation.)

In order to address the concerns about how the exemption was worded, and therefore would be interpreted, OSHA has modified the language in the final rule. The exemption is now worded as follows:

> Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*) and Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.

We believe these changes make the exemption clearer, and yet do not diminish the protections that are necessary for workers exposed to the chemicals involved.

There were a few other comments received regarding this issue as well. One was that training could still be done, based on the labels, rather than totally exempting the products from coverage (Ex. 11–141). As has been fully described in both the NPRM preamble and this document, MSDSs provide information that is necessary for the protection of exposed workers. Training cannot be done adequately without the information on the MSDS for the product. Others suggested that OSHA provide guidance on what it considers to be a consumer product (Exs. 11–38, 11–104). As OSHA stated in the preamble to the NPRM, a consumer product is anything that can be purchased in a retail store and is therefore available to the general public for personal or household use. One commenter also suggested that the exemption from the Maine right-to-know standard that was quoted in the NPRM was a better alternative (Ex. 11–93). We do not agree, and believe the changes incorporated herein address the situation appropriately.

Consumer products which meet the definition in paragraph (b)(6)(ix) are totally exempted from the requirements of the rule. Those which do not meet this exemption are exempted from further labeling under (b)(5)(v). Employers must still provide MSDSs and training on these products.

Nuisance particulates. In the 1985 ANPR, OSHA requested comments on the coverage of nuisance particulates. Under the HCS, all chemicals for which OSHA has a standard, or which are listed in the latest edition of the American Conference on Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values and Biological Exposure Indices annual publication, are to be considered hazardous for purposes of the HCS (paragraphs (d)(3)(i) and (ii)). At that time, OSHA had a generic permissible exposure limit (PEL) for all nuisance dust. There were also a number of substances listed in the threshold limit value (TLV) publication which are specifically identified as nuisance particulates. These substances were listed by name in the main table of the TLVs and in Appendix D, entitled ''Some Nuisance Particulates.'' The HCS covers any chemicals listed in the TLV publication, so these nuisance particulates were in fact part of the ''floor'' of chemicals covered by the HCS.

However, since any dust or particulate can potentially be a ''nuisance,'' OSHA decided as a matter of interpretation to limit coverage of this part of the rule to those nuisance particulates that were specifically listed at that time in Appendix D of the TLV booklet. OSHA further determined that if a substance listed in Appendix D was not included in an employer's hazard communication program, a *de minimis* notification would be issued as long as the substance did not pose a covered physical or health hazard other than its nuisance characteristics. A *de minimis* violation is one involving a technical violation of a rule, but which bears no relationship to safety or health. A *de minimis* violation has no penalties associated with it, and the employer has no duty to abate the condition.

The majority of those commenting in response to the 1985 ANPR stated that nuisance dust should not be covered (see, *e.g.,* Exs. 2–12, 2–23, 2–64, 2–77, 2–90, 2–107, 2–128, 2–144, 2–167, 2–193, 2–211). Additional comments recommending exclusion of nuisance dusts were received after the final rule as well (Exs. 5–84, 5–86, and 5–93). Edison Electric Institute's argument is an example of the comments received (Ex. 2–107):

> The purposes of the standard can be well-served even with the omission of nuisance dusts. Any solid (powder, flake, granules) can produce nuisance dusts. Requiring MSDSs on nuisance dusts would be impractical in some cases (*e.g.,* floor sweeping dusts), and of little use in others because those do not present a significant health hazard.

There were also a few comments which supported continued coverage of nuisance dust (Exs. 2–30, 2–59, 2–88, and 2–105), and others which addressed specific dusts such as flour (particularly with regard to baker's asthma) (Exs. 2–88, 2–153, and 2–166), and grain (Exs. 2–97, 2–125, and 2–160).

In the 1988 NPRM, OSHA proposed to exempt nuisance particulates which did not meet any of the definitions of health or physical hazards under the rule. Most participants who commented on this change supported the exemption (see, *e.g.,* Exs. 11–40, 11–50, 11–56, 11–90, 11–100, 11–147, and 11–160). However, it was suggested that the exemption was too limited (Ex. 11–135). This does not appear to OSHA to be true since the

dusts are being treated in the same manner as any other type of chemical would be.

There were concerns raised about the potential irritant effects of the dusts still being covered (Exs. 11–7, 11–51). If a properly conducted hazard evaluation indicates the potential to cause eye irritation, that is a covered hazard and the chemical would not be exempted as a nuisance particulate. Similarly, one commenter said that dusts which exhibit effects at high concentrations should not be exempted (Ex. 11–124). The hazard evaluation process for nuisance particulates is not any different than for any other chemical. If the dust does not meet the definition of hazard (at any concentration), it is not covered. Evaluation of the hazards of the dusts is to be done by the producer of the material. Again, dusts are not different from any other material under the rule in terms of hazard evaluation (Ex. 11–133). One commenter also stated that the exemption will discourage rigorous testing (Ex. 11–58). OSHA is not sure why this would be the case, particularly since it has been our understanding that many companies have undertaken more testing since the HCS was promulgated to help ensure that better information is available.

It was also suggested that physical hazards should not be considered to trigger coverage as the HCS was designed to address health effects, not physical hazards (Ex. 11–129). This statement is simply not true. The HCS has always covered all types of health and physical hazards. (See definition of ''hazardous chemical'' in 29 CFR 1910.1200 (c)).

Another suggestion was to extend the exemption to include nuisance ''droplets'' (Ex. 11–126). Mineral oil mist was the concern in this comment. Mineral oil mist has a specific PEL and is thus a hazardous chemical under the rule. OSHA does not agree that it would be appropriate to exempt any such chemical that is specifically regulated. Therefore, chemical manufacturers or importers must develop and transmit an MSDS and label for any substance with a specific OSHA PEL.

The ACGIH no longer lists a separate nuisance particulate appendix, although there is still a general recommended TLV for nuisance particulates. These would be exempt unless there is evidence they present a physical or health hazard separate from their nuisance characteristics.

OSHA is also clarifying that the burden of proof for this exemption belongs to the manufacturer or importer. The language in the NPRM was ''nuisance particulates for which * * * no evidence is found to indicate that they pose any covered physical or health hazard,'' and in the final rule reads ''nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard * * *'' This is consistent with the provision on wood dust. It also complies with Executive Order 12778 which, in order to reduce unnecessary litigation, requires each agency formulating proposed regulations to try to ensure that the regulations provide a clear and certain legal standard for affected conduct. Exec. Order No. 12778, 3 CFR 359 (1992).

Coverage of grain dust. Following promulgation of the revised final rule, a number of commenters objected to grain dust being considered a hazardous chemical under the rule, and to OSHA ''adopting'' the ACGIH TLV for grain dust (see, *e.g.,* Exs. 5–2, 5–16, 5–21, 5–32, 5–43, 5–57, 5–104, and 5–124). The majority of the comments on this subject submitted in response to the NPRM still objected to coverage of grain dust (see, *e.g.,* Exs. 11–43, 11–53, 11–63, 11–77, 11–109, and 11–151). Some indicated that OSHA's rule on grain handling already adequately covers training of workers (Exs. 11–67 and 11–109). OSHA's position on this issue remains the same—grain dust meets the definition of a hazardous chemical under the HCS, and is fully covered by the rule. To the extent that workers are already trained, this merely minimizes the burden of compliance.

Since publication of the NPRM, OSHA adopted a PEL of 10 mg/m^3 for grain dust under its 1989 Air Contaminants final rule (54 FR 2332). The Eleventh Circuit Court of Appeals vacated the final exposure limits designated in that standard on July 7, 1992. However, the AFL–CIO and the National Grain and Feed Association which had reached a settlement with OSHA on the new grain dust limit moved the appeals court to rule that its decision did not disturb this settlement. The court granted the motion on February 1, 1993, and stated that the agreement remains in effect. Consequently, OSHA will continue to enforce the 1989 limit (58 FR 35339). Information regarding this PEL must now appear on MSDSs for grain. Information regarding this PEL must now appear on MSDSs for grain.

As explained in the NPRM preamble (53 FR 29840–41), under the provisions of the original final rule, as well as the revised final, OSHA established a ''floor'' of chemicals which are always considered to be hazardous under the rule. These include chemicals which OSHA regulates, and chemicals which appear in the latest edition of Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, an annual publication of the American Conference of Governmental Industrial Hygienists (ACGIH) (now entitled Threshold Limit Values and Biological Exposure Indices)(paragraph (d)(3)). ACGIH is a professional society which is widely recognized as an authority in evaluation of the hazards of materials in the workplace, and establishment of recommended permissible exposure levels for those materials. During the rulemaking on the original rule, participants confirmed that if ACGIH finds a material to be hazardous, and thus establishes a permissible level for it, this is important information to be considered in the hazard determination process. (See, *e.g.,* 48 FR 53298–99.) Therefore, OSHA included this conclusion in the hazard determination process by stating that if the material appears on the ACGIH list, it is, by definition under the rule, a hazardous chemical. Chemicals listed by ACGIH (or regulated by OSHA), however, are not the only substances covered under the scope of the rule. If there is evidence to indicate a material presents a physical hazard in the workplace (*e.g,* flammability or combustibility) or if there is one statistically significant study that indicates a potential adverse health effect may occur upon exposure, the chemical is covered by the rule (paragraph (d)(2)).

OSHA has not ''adopted'' the threshold limit value (TLV) for any of the substances on the TLV list. It has simply stated that the fact that this recognized authority has found a substance to be hazardous is important information for exposed employees and users of a product to be aware of, as well as being aware of the level of exposure that authority has recommended. Where OSHA has specific exposure levels, this information must also be indicated on a MSDS, and if the producer has a recommended level—as many larger manufacturers do—this information must also appear. Thus the downstream employers will have the benefit of knowing that such recommendations and requirements exist, and this will help them design appropriate protective measures for their employees.

Whether these materials appeared on the TLV list or not is somewhat immaterial in terms of whether they are covered by the rule since, if they are not listed, an evaluation still has to be made of the available hazard data to determine if they meet the definition of ''hazardous chemical'' under the

standard. (See Ex. 11–124, comments from NIOSH specifically supporting the finding of hazard for grain dust.) For grain dust, there is evidence that it presents both a physical hazard (potential for explosion) and a health hazard (there is evidence that respiratory effects result from exposure). (See, *e.g.,* OSHA Final Rule for Grain Handling Facilities, 52 FR 49542; Ex. 4–29 (MSDS for grain); Ex. 4–30 (ACGIH documentation for the TLV for grain dust); Ex. 4–43 (OSHA Grain Elevator Industry Hazard Alert, 1/5/78); and Ex. 4–49 (U.S. General Accounting Office report on grain fumigation, 1981). Thus grain dust would be covered by the rule regardless of whether the TLV list is referenced or not. The additional TLV reference merely ensures that the downstream employers are provided the necessary information about available recommendations for control of the exposures to the material.

OSHA does not agree that it has ''delegated'' its authority to ACGIH under the rule, and the Agency certainly has not ''adopted'' the TLV under this rulemaking process. The HCS requires employers to disclose complete and current information on hazardous materials employees are potentially exposed to, and employees are entitled to receive available information on grain dust. It is not necessary for the Agency to make individual judgments about the hazards of each chemical under the HCS to determine if it is covered—the HCS is a generic rule which establishes criteria by which these judgments can be made by producers of substances, subject to review by OSHA through its enforcement procedures.

It should also be noted that the National Grain and Feed Association (NGFA) challenged the requirements of the revised final rule in the litigation described in the background section of this preamble. *Associated Builders and Contractors, Inc.* v. *Brock,* 862 F.2d 63 (3d Cir. 1988). The Third Circuit rejected the NGFA's arguments as having no merit. *Id.* at 69. NGFA petitioned the Supreme Court for a writ of certiorari, but their request was denied (November 29, 1988).

Radiation and biological hazards. Although OSHA has never considered either radioactivity or biological hazards to be covered by the HCS, we have received inquiries regarding such coverage, and therefore added specific exemptions for these types of hazards in the NPRM. These specific exemptions are being adopted in this final rule. If, however, another type of hazard is presented along with the material (e.g., a container with a biological sample packed in a hazardous solvent), then the container would be subject to the requirement of the HCS for the other hazardous chemical.

Several commenters supported the clarification regarding these types of hazards (Exs. 11–21, 11–48, and 11–50). Others suggested that biohazards should be included (Exs. 11–103; 37), and that the Centers for Disease Control could be responsible for generating MSDSs for such hazards (Ex. 11–103). OSHA believes that this particular rulemaking is more appropriately limited to chemical hazards, although we do not discourage employers from including coverage of such agents in their hazard communication programs. A separate rulemaking on occupational exposure to bloodborne pathogens (29 CFR 1910.1030) was recently completed, and should address some of the concerns of these commenters.

Suggestions for other exemptions. Several commenters suggested additional exemptions for the rule. One indicated that non-food products used by the food service industry (such as cleaners) should be exempt (Ex. 11–117). This obviously would not provide adequate protection for employees in that industry required to use such products, and no such exemption has been included.

Other commenters indicated that the HCS should only cover chemicals for which the Agency has made specific hazard determinations (Ex. 11–78), or initiated notice and comment on whether or not the chemical should be covered (Ex. 11–145). Such a substance-specific approach is essentially the system that was in place prior to the promulgation of the HCS, and only directly covered a few chemicals. As has been demonstrated, employees exposed to hazardous chemicals without benefit of information about the hazards and protective measures are at significant risk of experiencing health effects. This generic standard provides that broad-based protection, although OSHA will continue to use a substance-specific approach when necessary.

There was also a suggestion that the rule specifically exempt kitchen cabinets (Exs. 11–51 and 11–54). OSHA has made no explicit determination regarding kitchen cabinets in terms of coverage. If employees are exposed to hazardous chemicals during installation of such cabinets, they would be covered. It is the responsibility of the manufacturer of the products to do a proper hazard determination to decide whether or not they are covered under the rule.

Definitions

Article. The issues involving the article definition and exemption have already been described in detail in the preceding section. The modified definition for ''article'' being adopted is ''a manufactured item, other than a fluid or particle: (i) Which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities (*e.g.,* minute or trace amounts) of a hazardous chemical (as determined under paragraph (d) of this section) and does not pose a physical hazard or a health risk to employees.''

Commercial account. OSHA proposed a definition for ''commercial account'' to help clarify which retail distributors need to maintain MSDSs for their customers, and is adopting it as part of the final rule. The rationale for this is discussed further under the section of the preamble dealing with material safety data sheets.

The definition proposed was: ''commercial account'' means ''an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and at costs that are below the regular retail price.'' One commenter (Ex. 11–21) suggested that discounts are not always given, even to those who purchase large quantities over time. Therefore, to accommodate this concern, the final rule language indicates they generally purchase large quantities over time ''and/or at costs that are below the regular retail price.''

Exposure or exposed. An additional clarification has been made to the definition for ''exposure'' or ''exposed.'' The definition in the final rule referred to employees being ''subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g. accidental or possible) exposure.'' This was interpreted by a few people as meaning that if a chemical only poses a physical hazard (i.e. it is flammable but does not have any health effects), it would not be covered by the rule because the employee would not be ''exposed'' to it. This was certainly not the intent, as the employee would be ''subjected'' to the hazardous chemical by virtue of it being present in the workplace with the potential for burning, and thus injuring the employee. In order to ensure that such an interpretation is not erroneously

made, the clarified definition in this final rule refers to both physical and health hazards, rather than just a ''hazardous chemical''.

Hazard warning. The 1983 and 1987 final rules included a definition for ''hazard warning'' which states that it means ''any words, pictures, symbols, or combination thereof which convey the hazard(s) of the chemical(s) in the container(s).'' ''Appropriate hazard warnings'' are to be put on container labels. Since the rule covers ''physical'' and ''health'' *hazards,* specific information regarding these would be required on a label to comply and be considered appropriate. OSHA provided clarification regarding the Agency's interpretations of these requirements in the preamble to the revised final rule (see, 52 FR 31864). In the NPRM, the Agency proposed to incorporate these clarifications into the text of the rule. Thus the new definition proposed was that ''hazard warning'' means ''any words, pictures, symbols, or combination thereof appearing on a label or other appropriate forms of warning which convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for ''physical hazard'' and ''health hazard'' to determine the hazards which must be conveyed.) This modification is being adopted in this final rule. The Agency's interpretation of the rule in requiring health effects information, including information on target organ effects, was challenged and upheld in *Martin* v. *American Cyanamid,* on No. 92–3321 (6th Circuit September 15, 1993.)

In the development of the 1983 final rule, the Agency sought to require on labels that information that it considered to be necessary to employee protection, and which did not appear on many of the labels in use in industry at that time. It appeared to OSHA, based on the information available at that time, that labels frequently included precautionary information but infrequently enumerated the actual hazards of the chemical. In addition, the labels often lacked identity information. Thus OSHA chose to require that this limited information—the identity and hazards—be included on the label, while not precluding the addition of other types of information thought to be appropriate by the chemical industry. The rule also took a performance-oriented approach to the presentation of information, allowing various formats to be used as long as the information required by the HCS was included. OSHA did not endorse or support any particular existing labeling system as being in compliance with the requirements as drawn. In fact, it was thought likely that many existing labels, regardless of what system was used, would have to be revised to meet the new requirements.

Unfortunately, some have interpreted this performance-oriented approach to label format as allowing any label to suffice. This was not the intent of the rule, and OSHA has not enforced it in that manner. Furthermore, the rule does not permit label preparers to make judgments about the information to be included based on assumptions about downstream exposure situations. If the chemical is present in the quantities required to be considered a health hazard under the mixture provisions of the rule, and it is there in a form where employees can be exposed (i.e., it is available for exposure), then the demonstrated hazards must be included on the label. There is some professional judgment involved in assessing the weight of the evidence available to indicate that the hazard exists. Therefore, if there is one animal study as the only evidence of a particular adverse effect, it is likely that this generally would not be included on a label as part of an appropriate hazard warning, although it would have to be on the MSDS. Where there are multiple studies, or human evidence, professional judgment would result in a warning statement.

For products that are being shipped, the label is at certain points the only information available to people handling the container. Therefore, complete information must be available, and accessible in a fashion that does not require special training to use. Whether it's on a loading dock, or in a warehouse where only sealed containers are handled, it is necessary to have the complete hazard information for employees who may not have access to an MSDS.

For in-plant systems, OSHA has allowed some leeway with respect to the nature of the hazard information required on the label, so long as the employer can establish that its entire Hazard Communication Program is effective. Some of the labeling systems that pre-dated the HCS and which are used in-plant highlight the type and severity of the hazard and the personal protective equipment needed. These alternative in-plant labeling systems typically make use of a numerical and/or color coding to indicate the type and severity of a particular hazard (e.g., a ''health hazard'' rated at 4 would be a particularly serious ''health'' hazard). The labels are often supplemented by specific health effect information, but are sometimes limited to the generalized rankings.

These systems tend to be used in plants where there are large number of chemicals used, and the chemicals change frequently. These types of labels give the workers a quick snapshot assessment of the hazards. The labels also provide workers with information about the particular protective equipment needed in their work areas so they can properly and quickly protect themselves.

OSHA has permitted these types of systems to be used for in-plant labeling when the three-part Hazard Communication system is proven to be effective despite the potential absence of target organ effect information on the container labels. It is reasonable to allow this limited flexibility for in-plant labeling systems (as opposed to shipping labels) because in the in-plant context, the employer retains control over the entire hazard communication program within the workplace. In this limited circumstance, the employer can assure—through more intensified training—that its own employees are fully aware of the hazards of the chemicals being used. When these types of systems are used, the health effects information on the label may therefore be somewhat streamlined (in comparison to a shipping label for the same chemical) only because worker training—including training on the specific health effects of chemicals used—is proportionately intensified. Employers must ensure that their workers are aware of all information required to be conveyed under the HCS, and OSHA will make a plant-specific determination of the effectiveness of the complete program when an inspection is conducted. Any employer who chooses to rely on one of these types of alternative labeling systems instead of using labels which contain complete health effects information will—in any enforcement action alleging the inadequacy of the information conveyed through labeling—bear the burden of establishing that its overall hazard communication program has achieved a level of awareness among its employees which equals or exceeds the level of awareness that would have been achieved if the employer had used labels containing complete health effects information.

As will be discussed under labeling requirements, OSHA is incorporating this long-standing interpretive distinction into the requirements of the rule. Based on our implementation experiences, we believe that target organ information can be made readily accessible to workers in-plant through

all three components of the program. On shipped containers, however, it must be addressed on the label since the label will be standing alone in some situations, and workers may not have the training to understand every different type of labeling system they may encounter in these situations.

Hazard Determination

Mixtures. OSHA made one minor correction to the mixture provisions in the NPRM. Paragraph (d)(5)(iv) indicates that hazardous chemical components of a mixture in concentrations less than one percent (or in the case of carcinogens, less than 0.1 percent) are covered by the HCS if they can be released in concentrations which may exceed an OSHA exposure limit or ACGIH Threshold Limit Value, or could present a health ''hazard'' to employees in the concentrations released. OSHA incorrectly used the term ''hazard'' in this provision. A hazard is an inherent property of the chemical, and would exist no matter what quantity was present. OSHA intended to refer to the presence of a health risk to employees exposed to the chemical. The risk is a function of the inherent hazard and the amount of exposure. Therefore, in accordance with these scientific principles, OSHA corrected paragraph (d)(5)(iv) to state that such concentrations of hazardous chemicals are always covered by the HCS when they present a health risk to employees even if they are present in a mixture in amounts below the cut-offs.

Written Hazard Communication Program

Mobile worksites. Under the revised final rule, OSHA included what it termed a mobile worksite provision which permitted employers of employees who travel between workplaces during a work shift to maintain MSDSs at the primary workplace as long as the information is available to employees immediately in the event of an emergency (paragraph (g)(9)). Such employees would also have access to the MSDSs at the primary workplace prior to departing for the other sites, and when they return to the primary workplace. This appeared to OSHA to be a reasonable accommodation for such a work operation, but one which would still provide employees with immediate access to necessary information in an emergency and daily access to all information as a reference source.

Several commenters requested that OSHA clarify that in this situation the written hazard communication programs may also be maintained at the central workplace (Exs. 5–46, 5–67, 5–79, and 5–110). Therefore OSHA proposed to add the following paragraph to the written hazard communication program requirements (paragraph (e)(5)):

> Where employees must travel between workplaces during a workshift, *i.e.,* their work is carried out at more than one geographical location, the written hazard communication program may be kept at a central location at the primary workplace facility.

It should be noted that as in the situation with MSDSs, this exception is limited to work operations where employees are dispatched from a primary workplace each day, thus making it impractical to either carry a written program with them, or to have a duplicate copy at each site serviced (such as oil wells).

Few comments were received on this modification, but those that were submitted generally supported the approach proposed (Exs. 11–67, 11–90, and 11–101). OSHA has incorporated it into the final rule, but removed the phrase ''at a central location.'' The written program must be available at the primary workplace upon request, consistent with existing requirements in paragraph (e)(4).

Multi-employer worksite provision. When OSHA promulgated the original final HCS, there was a requirement in the written hazard communication program that employers include in the plan and implement ''the methods the employer will use to inform any contractor employers with employees working in the employer's workplace of the hazardous chemicals their employees may be exposed to while performing their work, and any suggestions for appropriate protective measures.'' 48 FR 53343, paragraph (e)(1)(iii). As described in the preamble to the NPRM (53 FR 29842–45), OSHA found substantial evidence in the record to indicate that the rule needed to address the issue of employers on multi-employer worksites exposing the other employer(s)' employees to hazardous chemicals.

In preparing the revised final rule, OSHA took the comments of rulemaking participants into consideration and included a multi-employer worksite provision in the written hazard communication program requirements (52 FR 31880; paragraph (e)(2)):

> Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:
>
> * * * The methods the employer will use to provide the other employer(s) with a copy of the material safety data sheet, or to make it available at a central location in the workplace, for each hazardous chemical the other employer(s)' employees may be exposed to while working;
>
> * * * The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,
>
> * * * The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

As described in the preamble to the final rule (52 FR 31865), this type of provision is necessary to ensure that all employees have sufficient information to protect themselves in the workplace, regardless of which employer uses the hazardous chemical. It also ensures that employers have the necessary information to adequately conduct training, and to select appropriate protective measures for the work operation.

It should be noted that the multi-employer worksite provision does not create the duty for each employer to have MSDSs on-site. That duty appears in paragraphs (g)(1) and (g)(8), which were not new requirements in the revised final rule. The multi-employer worksite provisions simply require that employers describe methods in their written HCS programs to make those already-present MSDSs available to the other employers on the site when the other employers' employees are being exposed.

Initial industry comments objecting to the multi-employer worksite provisions appeared to envision a situation where every contractor on a site duplicates every MSDS in his possession for every other contractor on-site. As has been discussed by OSHA repeatedly, the provisions of the rule simply do not require such an activity. First of all, the only time MSDSs must be shared is if the contractors are working in the same area of a site at the same time and thus exposing each other's employees. Secondly, the MSDSs can be made available in any way the employers on a site deem to be appropriate, *i.e.*, they can be made available in an office trailer on-site, they can be kept in the employer's truck, or they can be made available to both employees and other employers through electronic access.

The issue became somewhat confused when OMB disapproved the requirement to ''provide'' MSDSs on a multi-employer worksite (Ex. 4–67), as opposed to the multi-employer worksite

provision to have methods that would make the already-present MSDSs available to the other employers. OMB's action effectively removed the employee protections of paragraph (g). Furthermore, there appears to be some misunderstanding about what a multi-employer worksite is (Ex. 11–116). Such a site is not limited to construction. Any type of workplace where there are employees of more than one employer working is a multi-employer site. It is likely that every worksite is a multi-employer worksite at some point.

A number of the comments received subsequent to OMB's actions favor keeping the MSDSs in a central office location and providing them on request (Exs. 11–1, 11–141, 11–142, and 11–155). Others simply object to MSDSs on every site, and support OMB's approach (Exs. 11–13, 11–110, 11–114, 11–135, and 11–154). These employers claim that employees are not interested in the MSDSs (Ex. 11–6); there are too many of them to keep them at the site (Ex. 11–24); and there is no place to keep them on the site (Ex. 11–142).

Other commenters, however, emphasized the importance of maintaining MSDSs on-site, for the benefit of employees as well as for making them available to other employers. ''U S WEST supports the basic requirements regarding provision of material safety data sheets (MSDS) at multi-employer work places. In fact, U S WEST would be supportive of stronger language to emphasize the responsibility of employers who produce, use or store hazardous chemicals at a workplace to adequately communicate potential hazards to the employees of other employers.'' Ex. 11–50. See also Exs. 11–51, 11–54, 11–90, and 11–124. And as another commenter indicated (Ex. 11–40): ''Common sense should serve as the linchpin for establishing the presence of material safety data sheets (MSDS) on multi-employer work sites. Very simply, some provision must be made to advise workers of any actual or potential hazardous exposure while on the work site.''

The ACCSH subcommittee which recommended a change to this provision also appeared to be confused. They recommended that the provision address an employer's duty to obtain MSDSs for chemicals his/her employees are exposed to that are generated by other contractors. The duty to obtain MSDSs appears in paragraph (g)—the multi-employer worksite provision's only purpose is to ensure that the other employer's written program describes the methods that will be used to provide the MSDSs. The ACCSH-recommended change does not accomplish that purpose.

As was discussed in the history section of this preamble, OMB's disapproval has been invalidated by the Third Circuit decision which was subsequently upheld by the Supreme Court. Therefore, all of the requirements are currently being enforced.

The current rulemaking activity has not provided any substantial evidence that the requirements are unnecessary or inappropriate.

Without MSDSs the hazard communication program will not be effective. The consensus of the participants in the rulemaking on the original final rule was that labels can only provide limited information—the MSDS provides the detailed source of information. Most concurred with OSHA's conclusion that a program cannot be effective without all of the major components currently in the OSHA rule—including MSDSs being available to employees and employers at the job site (see, *e.g.,* H–022 Exs. 19–62, 19–91, 19–124, 19–156, 19–185, and 19–199.) As will be discussed further below, comments objecting to the use of MSDSs have been received in this rulemaking. However, these participants have not provided evidence that has persuaded OSHA that employees can be protected appropriately without the information available on the MSDSs.

The argument that there may be large numbers of MSDSs on multi-employer worksites does not mean that employees should not be protected from those chemicals. Although cumulative numbers are large (Ex. 11–142, the Coalition indicates that on a particular homebuilding site there were 302 MSDSs required), the fact remains that for most individual contractors the number per site is much smaller and quite manageable (those 302 MSDSs were accumulated by 38 subcontractors, for an average of 8 MSDSs per subcontractor.)

Many of these same employers would have OSHA believe that there are no trailers or offices on these sites, and no vehicles, so they have no place to keep the MSDSs (Tr. 5–50; 54; 57). As has been stated in the record before (53 FR 29845), every job site has a significant amount of paper associated with it, including blueprints, building specifications, building permits, etc. See, *e.g.,* Ex. 4–162. We believe that employers can keep the MSDSs in the same location as these other papers.

By removing the MSDSs from the site, employers are creating a barrier to access, *i.e.,* it is far less likely that employees will request MSDSs from a remote site. If an employee is on the site for one day only, as these employers indicate is often the case, it is unlikely that a request will be made for the MSDS to be delivered at some later time. (Similarly, experiences under state laws that allow extended periods of time for delivery of the MSDS (such as 15 days), are not analogous. In 15 days, the construction employee's exposure would likely have long since ended, and he/she would probably be at another job site. Provision of MSDSs under these conditions does not serve the purpose of being available prior to exposure to prevent adverse health effects from occurring.) And although construction employers maintain that employees are not interested in MSDSs, evidence from other industries indicates that employees do use MSDSs when they are readily accessible (Ex. 4–75).

OSHA has costed out the alternative of providing MSDSs on request through delivery from a central office location, although this would not be an acceptable alternative to the current requirement because it is not at least as protective and therefore does not protect employees to the extent feasible. The costs were calculated using the percentage of employees reported to be using data sheets in the study referenced above (Ex. 4–75), and assuming a short and a long distance request for the information, and thus the time for delivering the MSDS. Ex. 71–70. This analysis reveals that it is less costly to maintain the MSDSs on-site as currently required, rather than responding to requests from employees and delivering the MSDSs to the site upon request.

Therefore, the alternative suggested to maintain MSDSs at the office, and provide them on request, is not only less effective but also more costly. OSHA is maintaining the current requirement for MSDSs to be available on-site for employee access and to be accessible to other employers when necessary due to exposure of their employees.

We have modified the language of the provision to address some of the misinterpretations discussed in the comments. The applicable provision will now read: ''[T]he methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working.'' This removes the language that employers have been interpreting as meaning they had to physically give each employer a copy of every MSDS, or create an office to deposit them. Whatever means the employers find appropriate for the on-site access on a particular job will be acceptable. Thus

a repository in the trailer may be used; they may be accessible electronically; or each subcontractor could keep his/her own MSDSs in the company vehicle on the site. The key to ascertaining compliance is whether the MSDSs are readily accessible (i.e., there are no barriers to accessing the information) to exposed workers as well as other employers.

Labels and Other Forms of Warning

As noted above under the discussion of the definition of ''hazard warning'', OSHA proposed to modify the language in paragraph (f)(5)(ii) regarding in-plant labeling requirements to clarify that employers may, as an alternative to specific hazard warnings, provide more general hazard information on the labels as long as the specific physical and health hazards of the chemicals are effectively conveyed through implementation of the other aspects of the hazard communication program (*i.e.,* provision and explanation of data sheets and more extensive training). For example, some labeling systems indicate the presence of an acute ''health hazard'' and rate the severity of that ''hazard'' using a number system. The specific health hazard is not on the label under this system, but is available on the MSDS. Employers using this type of hazard rating system must ensure that the worker has the required immediate access to the data sheet, and understands the labeling system used and how to obtain and use the information provided. The training program will generally need to be more detailed to address these aspects of the employer's hazard communication program. An employer relying on one of these labeling systems will have to augment his training program to specifically address target organ effects that may not be readily discerned from a numerical or symbol warning system. Precautionary statements alone are not considered to be general hazard information under this provision.

The proposed modification was not a change in Agency policy or interpretation of this requirement. Since 1985, OSHA's instructions to its compliance staff have included allowances for these types of systems in a facility. For example, the current directive, CPL 2–2.38C, states:

> OSHA recognizes that the degree of detail on a label needed to convey a hazard may be different within a workplace where other information is readily available compared to labels required on shipped containers, where the label may be the only information available.

Several commenters indicated that the proposed distinctions are helpful (Exs. 11–10, 11–51, and 11–139), and supported the change to the definition of ''hazard warning'' (Exs. 11–21, 11–86). There was a suggestion that the acceptance of specific labeling systems be indicated (Ex. 11–10). OSHA does not agree with that approach. In keeping with the performance-oriented approach of the rule, whatever in-plant labeling system is used will be judged during a compliance inspection in the context of the effectiveness of the entire program.

There were also suggestions that the language be modified to indicate that only ''significant'' hazards need to be warned about (Exs. 11–48, 11–90). OSHA does not agree with that suggestion. The HCS requires warnings on all well-substantiated hazards. If the weight of the evidence demonstrates that a hazard is ''well-substantiated'', the hazard must be warned about regardless of its perceived severity.

One commenter noted that Department of Transportation (DOT) placards on cargo will generally not indicate target organs (Ex. 11–68). This is true, but the actual containers being shipped are the ones that would be labeled in accordance with OSHA's requirements, rather than the shipping containers. The only time this would be a problem is when there is a bulk shipment, and the shipping container is the only container. OSHA has already addressed this by allowing the additional label information to be with the shipping papers, rather than on the outside of the shipping container.

There were objections to this modification from representatives concerned about information available to workers (Exs. 11–21, 11–125). OSHA believes that its compliance policy to assess the effectiveness of the entire program will ensure that complete information is available to workers in all situations.

One commenter (Ex. 11–86) thought in-plant labels should only have the name of the chemical, not the hazards. OSHA does not agree with this—the label must provide hazard information to be an effective reminder of the more detailed data available elsewhere on MSDSs and in training. Additionally, MSDSs cannot be substituted for labels—they serve different purposes and contain information presented in a different fashion. ''Hazard warnings'' provide a brief summary of the hazards in a highlighted form. The MSDS provides more detailed information.

The current HCS did not address the issue of updating labels when new information becomes available regarding the hazards of the chemical. OSHA is clarifying this situation by adding a provision which is consistent with the updating requirements for material safety data sheets, *i.e.*, the new information is to be added to the label within three months of becoming aware of significant new information regarding the hazards of the chemical.

ANSI Standard for Precautionary Labeling. As noted in the preamble to the NPRM (53 FR 29542), the American National Standards Institute (ANSI) revised its standard for precautionary labeling of industrial chemicals (Z129.1–1988) to include, among other things, guidance for target organ effect labeling. A copy of the final document has been available in the record (Ex. 49). OSHA invited comment on whether the Agency should recognize (either in the final rule or in a compliance directive) that the ANSI standard provides employers with useful guidance to produce an acceptable label for compliance with the HCS. In other words, if the employer follows the guidance provided by ANSI, that would be one way to comply with the requirements of the HCS. Employers would still be free to use other labeling systems or approaches to labeling, where appropriate, as long as they meet the requirements of the HCS. But those employers who wish to have more specific guidance to follow would be able to use the ANSI standard to assist them in complying. OSHA indicated that it was particularly interested in comments about the extent of target organ information that would be on a label under the ANSI scheme, and whether this would provide enough information to comply with the HCS.

A number of comments were submitted which supported the use of the ANSI standard as compliance assistance (see, *e.g.*, 11–51, 11–57, 11–106, 11–143, 11–147, and 11–156). Many of these also emphasized that it should not be considered to be the only way to comply, just one method that could be used. There were also related suggestions that a uniform labeling approach would be helpful (Exs. 11–124 and 11–155).

An objection was raised about the public's opportunity to comment on the final ANSI standard before addressing it in the HCS (Ex. 11–125). The ANSI standard was finalized prior to the publication of the HCS NPRM, and was available in the docket as Ex. 4–110. As OSHA specifically solicited comments on this issue in the NPRM, the public was given an opportunity to provide input.

OSHA believes that the ANSI standard provides much useful information for employers required to prepare product labels. The standard has been revised significantly since the

previous version was issued in 1982, and provides helpful guidance in new areas, such as classification of carcinogens, mutagens, and teratogens for purposes of labeling, and the addition of phrases to be used to report target organ effects. All of this information would assist employers in complying with the HCS.

OSHA does have one concern, however, regarding the health hazard evaluation process. As the Agency has stated from the outset of this rulemaking, the HCS is based on the premise that chemicals have inherent characteristics that pose potential hazards, and workers have the right to know what those potential hazards are. Risk of exposure is to be addressed in training, not in the process of deciding what information will be provided on labels and MSDSs. Any well-substantiated hazard must appear on the label where there is a potential for exposure.

The ANSI standard, on the other hand, specifically states that the labeling recommendations are not based only on the inherent properties of the chemical, but are directed to the avoidance of hazardous exposures resulting from customary and reasonably foreseeable occupational use, misuse, handling and storage. The health hazard evaluation also refers to an exposure assessment being performed.

It is possible for someone following the guidance in the ANSI standard to construct a label that is complete enough to satisfy the requirements of the HCS. OSHA's concern is that information may be eliminated from some labels based on the ''exposure assessment'' factor, and employers will not be in compliance with the HCS. The inability of the producer or importer to accurately predict downstream exposures, and thus the need for complete disclosure of hazards, was discussed in the original final rule (48 FR 53296), and is still applicable.

Therefore, employers must be advised that while following the ANSI standard would provide useful assistance to them when preparing labels, it does not guarantee compliance. Employers must also be aware of the requirements of the HCS, which, among other things, may be interpreted to have a lower threshold than ANSI for reporting hazard information. OSHA believes that the use of the ANSI standard will generally be very helpful to employers when complying with the HCS, and that labels will be improved through the availability of this voluntary consensus standard. A reference to it will be included in the Agency's instructions to its compliance officers.

Labeling limitation for certain shipments. In the revised final rule, OSHA made a change to the labeling requirements for shipments of solid metal. Solid metal is often considered to be an ''article'' under the rule, and thus exempt. Where the metal is not an ''article'' since its downstream use results in hazardous chemical exposure to employees working with it, a provision was added which allows shippers of this type of material to send the label information once, similar to material safety data sheet transmittal, as long as the material is the same and it is being shipped to the same customer. In these situations, there should be no hazard to anyone handling the metal from the time it is produced in solid form until the time someone works on it in a way that releases a chemical hazard. Since the label information transmitted would only reflect the chemical hazards released when it is later worked on, the label would not provide any hazard information that is needed by those handling the material in transit. The label information does serve a different purpose than the MSDS as the label is an immediate visual warning, a ''snapshot picture'' of the hazards, whereas the MSDS provides detailed hazard information. Thus both information transmittal sources are necessary. It was emphasized in the preamble that this exception is only for the solid metal itself—any hazardous chemicals present in conjunction with the metal in such a form that employees may be exposed when handling the material (*e.g.*, cutting fluids, lubricants, and greases), would require labels with each shipment.

OSHA proposed to further modify this exception to include wood, plastic, and whole grain. The Agency believes the situation involving wood and plastic is analogous to solid metal in that the hazard potential is in the downstream use and does not involve employees involved in transit. For whole grain, OSHA recognized that some dust may be generated during the transportation process, but believed that the repetitive nature of the shipments and the relatively small amount of dust generated due to the handling at this stage makes such an exemption appropriate. (See, *e.g.*, Ex. 5–13, 5–15, 5–21, 5–52, and 5–92.) The Agency invited comment on this extended exception. Supporting comments were received (see, *e.g.*, Exs. 11–51, 11–54, and 11–90). The modifications are being adopted in this final rule as proposed.

One commenter suggested that it be clarified that only containers are required to be labeled, not pieces of wood, etc. Ex. 11–137. This is true. However, ultimately these items are in some sort of container for purposes of shipment, from shrink-wrapped pallets to the truck itself. Thus labels are still required for the shipment in this situation, unless the items are covered by the one-time labeling approach incorporated into the final rule.

With regard to this change in requirement for shipments of whole grain, most of the comments from the grain industry were concerned with totally exempting grain dust rather than the specific labeling limitation. Several objected to any labels for shipments of whole grain (Exs. 11–94, 11–109, 11–129, and 11–160), also indicating that all facilities already have both labels and MSDSs. If this is the case, they are already in compliance with the rule so there should be no problem with this provision. The exemption was also supported (Ex. 11–67).

The American Iron and Steel Institute (AISI) testified that the exemption for solid metal should be extended to include the coatings on the metals (Ex. 70). They suggested that employees involved in the transport of large steel items in particular would not be exposed to potential hazards due to the manner in which the items are handled. OSHA does not agree. There is still a risk of contact dermatitis, and thus workers need to be warned regarded these hazards.

Other comments on labeling. A number of comments were received suggesting that the labeling requirements be changed. In particular, it was suggested that the information on the labels be expanded in lieu of requiring material safety data sheets (see, *e.g,* 11–8, 11–75, 11–104, 11–118, 11–132, 11–147, and 11–156). ''For non-manufacturers, it is more efficient for workers to obtain their warnings from the labels on containers of chemical products. The labels accompany each product and are always readily available to the user. Labels are required to contain all significant dangers.'' Ex. 11–104.

Specific suggestions for labels included precautionary statements (11–17, 11–57, and 11–125), and the telephone number of the supplier (11–38, 11–115, and 11–150). In terms of precautionary statements, employers are free to include such information. However, as discussed at length in the original final rule (48 FR 53300–05), the purpose of the label is to provide an immediate visual warning of the hazards. Label warnings tend to be the same from product to product (*e.g.*, nearly everything is harmful if inhaled).

This type of information does not tell the worker what the hazard is. Furthermore, most producers already include such information on their labels—the missing elements generally involve what the hazards actually are. With regard to the telephone number, OSHA originally proposed the number be included on labels (47 FR 12121). There were numerous objections from producers to this requirement. Thus OSHA limited the telephone number provision to the MSDS, rather than the label. The information is available through the MSDS to all employers, as well as to health professionals providing services to exposed employees.

Material Safety Data Sheets

An issue that is related to the coverage of consumer products, and is undoubtedly the genesis of some of the recommendations to eliminate such products from coverage, is the distribution of consumer products in commerce. It is important to point out that the vast majority of consumer products are not covered by this rule. Only those which are hazardous are potentially covered, and within that group, only those which are used in the workplace. Producers of the materials which, while marketed to consumers, are also likely to be sold to employers and used in the workplace are well aware of that potential market. (See, *e.g.,* Ex. 2–148.) Thus manufacturers of materials used in construction, graphic arts, and cleaning operations, are aware that their products have industrial applications even when sold as consumer products. MSDSs have already been prepared and distributed for many, if not most, of these products. Manufacturers are required to have MSDSs for their own workers, and have already been required to distribute such MSDSs to non-manufacturing customers in a significant number of states with right-to-know rules. Furthermore, most manufacturers have and make available MSDSs because of product liability concerns separate and apart from any regulatory requirements. This was certainly demonstrated in the record by the large number of manufacturers that produced MSDSs in the absence of such requirements prior to promulgation of the original HCS. The sealed container provision also eliminates many consumer products from full coverage in workplaces where employees may handle such materials, but do not open the containers to use them. Employees may, however, request data sheets for the chemicals they only handle in sealed containers.

The record for the original final rule strongly supported the need for automatic transmittal of MSDSs from producers to users through the supply chain. The cost analyses of the rule demonstrated that a system that relies on users requesting a copy of a MSDS will be more costly, and less protective (48 FR 53327). However, in the revised final rule, OSHA determined that where retail distributors are involved in the distribution chain it was necessary to slightly revise this position. Therefore, the revised final rule stated (52 FR 31882, paragraph (g)(7)):

> Retail distributors which sell hazardous chemicals to commercial customers shall provide a material safety data sheet upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available. Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors which have informed them that the retail distributor does not sell the product to commercial customers or open the sealed container to use it in their own workplaces.

OSHA provided the following rationale for this departure from the automatic provision approach found to be necessary in the original final rule (52 FR 31866):

> Retail distributors, however, often sell to businesses and the general public and frequently have no way of knowing who a particular purchaser is. Under the current rule, retail distributors might have to give material safety data sheets to each customer to ensure that commercial customers get the information they need under the HCS. A specific statement regarding retail distributors is, therefore, included in paragraph (g)(7) to address this practical problem. Those retail distributors who sell hazardous chemicals to employers must provide a material safety data sheet upon request, and must post a sign or otherwise inform the employers that an MSDS is available.

OSHA recognizes that although it is possible for an employer to incidentally purchase a hazardous chemical from any type of retail establishment, it is not reasonable to expect every retail store that happens to carry such materials to keep a file of MSDSs in case an employer decides to make a random purchase at the store. We further recognize that such random purchases would normally be of small amounts that would generally be used as a consumer uses them, and thus would be exempt under the rule anyway. However, even in those cases where they are used in greater quantities, it appears more reasonable to place the burden on the user in that situation to obtain the MSDS than to have every retail establishment keep large numbers of them on file. This provision also limits the number of establishments to which distributors of such products have to transmit MSDSs.

The National Retail Merchants Association (NRMA) (Ex. 5–74) indicated that the revised final rule ''* * * has struck a good balance between the obvious problem of requiring retailers to train all employees about every product which may appear on retailers' shelves, and the real need for employee training for emergency spillage of packaged products.'' They did think, however, that the definition of ''consumer product'' as stated by CPSC might be confusing to retailers, particularly small businesses, since ''retailers would have to go through the process of examining all goods sold in their stores to determine if they are or are not consumer products.'' In fact, if retailers are selling the products, they are considered to be ''consumer'' products, and there is no determination to be made by the retailer in this respect. In this situation, deciding whether a product is a consumer product or not is a determination made by the producer in developing the appropriate label for the material based upon its intended use.

With regard to the issue of making MSDSs available at the retail distribution level, NRMA suggested that OSHA define the term ''commercial account'' to ensure it is being properly interpreted and applied. They further suggested that this definition be related to selling items in large quantities and below the regular retail price. ''Such accounts can be identified, and it would be less burdensome to notify such customers that MSDSs are available upon request. In fact, many retail firms have already done this under many state right-to-know laws.'' (Ex. 5–74).

The United Brotherhood of Carpenters and Joiners of America (UBCJA) similarly noted that with regard to MSDSs being available from retail distributors (Ex. 2–105):

> [T]hose contractors who do purchase materials from retail outlets generally buy them from a building-supply house that sells such materials in larger quantities, and may give them a volume discount. These stores would have no problem supplying MSDSs to customers * * *.

OSHA agreed with the NRMA that adding such a definition would clarify that many retail distributors have no need to maintain MSDSs because they do not generally supply hazardous chemicals to commercial customers (*e.g.*, grocery stores, clothing stores). Therefore, we proposed a definition for the term ''commercial account'' based upon NRMA's recommended criteria, and invited comment on the appropriateness of this approach. In

addition, we proposed to further modify the language in paragraph (g)(7). The language regarding the general duty for distributors to provide MSDSs was modified to track the language in paragraph (g)(6) immediately preceding it regarding the duty of chemical manufacturers and importers to transmit such information with their initial shipment and with the first shipment after a material safety data sheet is updated. Previously, the rule simply stated that ''distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers.'' This slight modification clarifies that distributors are required to provide MSDSs in the same manner that chemical manufacturers and importers do.

Proposed paragraphs (g)(7) (iii) and (iv) further indicated that retail distributors only need to provide MSDSs if they have commercial accounts for employers purchasing hazardous chemicals. If an employer incidentally purchases a hazardous chemical from them, and they are not required to have an MSDS available since they don't use the chemical or have commercial accounts, then the retail distributor's duty is limited to providing that employer with the name, address, and telephone number of the supplier from which the MSDS can be obtained.

As discussed earlier in this preamble, a number of distributors suggested that they be deleted from the coverage of the rule in terms of MSDSs, either by eliminating them from the chain of distribution for the information or by dropping requirements for MSDSs. The record does not support either of these approaches as being a viable alternative for the HCS.

In general, the commenters on the proposed modifications supported the changes (see, *e.g.*, Exs. 11–11, 11–93, 11–106, 11–111, 11–117, and 11–147). ''[W]e agree with the modifications made to the definition of commercial account, and the requirement that retail establishments would only have to make MSDSs available upon request to these customers only.'' Ex. 11–11. Some thought the approach was better but still needed further revision (Exs. 11–115, 11–132). ''The proposed modifications of the Standard enunciated in the notice of proposed rulemaking are a step in the right direction. We urge further modifications * * *.'' Ex. 11–115.

The State of Maryland pointed out that with the proposed modifications, a gap was created in the distribution chain with regard to MSDSs since there was no explicit requirement for manufacturers, importers, and distributors to provide MSDSs in response to requests from downstream employers purchasing products from a retail distributor without having a commercial account. ''There is no requirement (here or elsewhere) that the manufacturer, importer, or distributor supply that employer with an MSDS, effectively leaving a hole in the previously closed 'loop'.'' Ex. 11–21.

Other commenters noted that wholesale distributors that have over-the-counter sales should be permitted to provide MSDSs on request as their operations are similar to those of concern in retail establishments. ''The fact is that wholesaler-distributors, like retail businesses, sell products to employers that do not have a commercial account and do not use the product itself. Additionally, wholesaler-distributors, like retail establishments, sell products in walk-in, over-the-counter transactions.'' Ex. 11–111.

There were also a few comments that did not support the modifications. In particular, worker representatives were concerned that employees would be required to use the chemical immediately, without benefit of the MSDS information (see, *e.g.,* Ex. 125).

OSHA is adopting the modifications in the final rule. In addition, the Agency has changed paragraph (g)(6) to break it down into subparagraphs similar to the changes being made to paragraph (g)(7). As suggested by the State of Maryland, a specific requirement for chemical manufacturers, importers, and distributors to respond to requests has been added. In addition, OSHA has added a provision to paragraph (g)(7) that would allow wholesale distributors to provide MSDSs on request in over-the-counter sales operations.

These provisions, in summary, are intended to clarify the obligations of chemical manufacturers and importers to provide MSDSs to downstream distributors and employers. OSHA especially means for these requirements to apply in three situations: Where a distributor or employer does not receive an MSDS from the manufacturer or importer; where a distributor or employer who has purchased a hazardous chemical in the normal course of business needs a replacement MSDS; and where an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have MSDSs on file.

A number of other comments were received regarding the distributor requirements of the rule. One noted that distributors would not have MSDSs to protect their own employees if they have commercial accounts (Ex. 11–21). However, many of these employers already come under the sealed container provisions of the rule and only have to obtain MSDSs if their employees request them. If they use the chemicals, they will have to have one as well. Another thought the retailer should have to ask the employee making a purchase if an MSDS is needed (Ex. 11–133). This seems to defeat the purpose of allowing the on-request system to alleviate the burden in over-the-counter operations.

The National Welding Supply Association (Ex. 54) appeared to be under the impression that the rule previously allowed distributors to provide MSDSs at some time after the shipment, when it was convenient for them. They thus viewed the clarification as a change in duties. In fact, the distributors were always required to provide MSDSs at the time of the initial shipment, just as the chemical manufacturers and importers were required to do so. Sending it at some undetermined later time would not provide timely protection for workers.

There was also a suggestion that the term ''retail'' distributor be defined. Ex. 11–103. This does not appear to be necessary as the Standard Industrial Classification (SIC) Codes already define and delineate between retail and wholesale distribution. The commenter was particularly concerned about dental product distributors defining themselves as ''retail'' distributors to avoid the automatic provision of MSDSs. Dental product distributors are not retail establishments. Retail establishments primarily sell to the general public for personal or household use. Distributors, such as those providing dental products to dental offices, that sell primarily to businesses, institutions, professional offices, etc., are considered to be wholesale distributors. They are thus required to provide MSDSs automatically with their first shipment of a hazardous chemical to the dental office, and also with the first shipment after the MSDS for a product is updated.

Several commenters also suggested that retailers be required to request MSDSs, rather than requiring upstream distributors to ascertain the need of the retailers for the information. Exs. 11–106, 11–150, and 11–158. As discussed previously, this ''on request'' system is not as efficient, and is in fact more costly, than the automatic transmittal.

One concern raised was that chemical manufacturers should not have to keep track of the employers they provide MSDSs to on request, where the chemicals were purchased from a retail distributor (Ex. 11–156). In other words,

these requestors are not actually customers of the chemical manufacturer and when the MSDS is updated, it should not have to be routinely provided to these employers. In fact, the standard does not require such an approach. Updated MSDSs only have to be provided with the next shipment to a customer after being updated. If the shipment is going to a distributor, the MSDS is sent there. It would be up to the employer making the purchase from a retail distributor to ask for the current MSDS.

A number of commenters discussed the widespread distribution of MSDSs for products that do not require them (see, *e.g.,* Ex. 11–158; Exs. 22, 25, and 30). Many chemical manufacturers and importers are preparing MSDSs for all of their products, whether they are hazardous or not, and whether they are required by the HCS or not. This is apparently being done because some customers request MSDSs for all products, not just those that are hazardous. In addition, it is intended to provide adequate warning in light of product liability concerns.

OSHA certainly cannot prevent anyone from providing MSDSs for products that are not covered by the rule. In fact, it is often useful to know that there is no hazard associated with the product, and MSDSs are often being requested so customers can assure themselves that the hazards have been evaluated.

It does present a problem, however, for distributors. In particular, distributors of products that are considered to be articles are receiving numerous data sheets for these items, and are thus having to either distribute them or determine whether they have to be distributed. (See, *e.g.,* testimony of the National Association of Electrical Distributors, Tr. 2–121–161.)

Distributors do not have to provide the MSDSs to downstream customers for products that are not hazardous under the rule. OSHA is aware that many of the MSDSs provided for articles and other exempted products indicate on them that the MSDS is not required under the HCS. We encourage all producers of such items to include that information on the MSDS. One commenter suggested that the rule require that the MSDS indicate whether the chemical is within the scope of the HCS. Ex. 11–117. Others made this same suggestion in response to the request for comments and information OSHA published in May 1990. It will be considered if the rule is reopened to address improvements to MSDSs. It would help both the distributor, and the ultimate user of the material, to have a clear indication as to whether the product is actually hazardous within the requirements of the rule. (For example, construction contractors testified that they have received MSDSs for items such as flashlight batteries, and were thus confused regarding whether or not these items had to be addressed in their hazard communication program. See, *e.g.,* Tr. 5–47.)

There were also suggestions that chemical manufacturers be required to provide MSDSs in each carton or unit they ship (Exs. 11–117, 11–158). This would result in the proliferation of many more MSDSs than are required to satisfy the purposes of the rule.

Additionally, one commenter suggested that manufacturers be required to compile relevant MSDSs into a ''unitary reference source'' and periodically revise it (Ex. 11–158). It appears that this means that manufacturers should include all MSDSs for their product line in one book, and send all of them to each customer. Although some manufacturers have chosen this way to comply, and it would be acceptable, this alternative also results in the proliferation of many more MSDSs than the rule requires. A similar suggestion for shifting the burden is to require the chemical manufacturers to supply customers with the MSDSs directly. This is less cost-efficient, the chemical manufacturers frequently don't even know who the customers are, and it increases the possibility that chemicals will be used without information.

As discussed previously, OSHA recognizes that there are burdens associated with complying with the rule (*e.g.,* Ex. 11–132). However, these burdens are necessary to protect employees, and are ultimately borne by the downstream users of the chemicals as the costs will be reflected in the costs of the products. The automatic provision of the MSDSs is far less burdensome than the alternative ''on request'' system suggested by some of the commenters (see Ex. 71–70).

A number of other comments were received regarding MSDSs. One commenter noted that the MSDS requirements are not sufficient to protect producers against product liability (Ex. 11–7). As far as OSHA is concerned, this is irrelevant to the rulemaking. The purpose of the HCS is to provide appropriate information to employees and employers. If producers want to provide additional data to satisfy product liability concerns, that's their prerogative.

Inclusion of SARA Title III hazard categories on the MSDSs was also suggested (Exs. 11–38, 11–52). OSHA is aware that some producers are including such information, and encourages others to do so. However, since that information is not required to protect workers, OSHA does not have the authority to require it or prohibit its being on the MSDSs.

Another comment was that manufacturers should not be allowed to provide only component information on the MSDSs for mixtures (Ex. 11–50). The HCS requires data available on mixtures tested as a whole to determine its hazards to be utilized first before data on the hazards of its components. Component information is only permitted when there is no information on the mixture as a whole. The HCS does not require testing of a mixture in any way—chemical manufacturers and importers are allowed to rely on currently available information for components of the whole mixture where no information exists for the mixture as a whole.

This same commenter also said that OSHA should not permit chemical manufacturers and importers to put ''worst case'' recommendations on MSDSs rather than realistic recommendations (Ex. 11–50). MSDS preparers are required to provide accurate information on MSDSs. If a recommendation is not accurate, the chemical manufacturer or importer could be cited. OSHA is aware that there are MSDSs that have information on them that is not accurate in this regard. For example, the MSDS may indicate the material is not hazardous, yet under precautionary measures it is suggested that if the material gets on the skin, it must be washed off immediately. The precautionary measures must be consistent with the hazards of the chemical, not simply written to protect the liability of the manufacturer by suggesting more protective measures than are necessary.

It was also suggested that MSDSs should only be updated when changes are significant (Ex. 11–60). In fact, this is what the standard already requires. Chemical manufacturers and importers may be updating them more frequently to meet their internal requirements, but the rule simply requires updating when there is ''significant'' information of concern. Paragraph (g)(5).

A request was also received to clarify who is responsible for ensuring the MSDS is with the shipment and available in marine cargo handling operations. Ex. 11–68. The MSDS does not have to be ''with'' the shipment—it only has to be provided at the time of the first shipment. Marine cargo handling operations would generally come under the limited sealed container

provisions of the rule, in which case MSDSs only have to be obtained by the employer when an employee requests it.

Other commenters suggested that the format for the MSDSs should be standardized (Exs. 11–103, 11–124). OSHA has provided a non-mandatory format (OSHA 174) for those chemical manufacturers and importers that choose to use it. As described earlier in this preamble, subsequent to this rulemaking, OSHA published a request for comments and information on ways to improve the information presented on labels and MSDSs. OSHA is also aware that the Chemical Manufacturers Association has prepared guidelines for the preparation of MSDSs (Ex. 11–90 and Ex. 49), and that an ANSI standard is being developed. International activities regarding harmonization of formats and information are underway as well (Exs. 75 and 71–12), and there is research being conducted regarding MSDS variability, appropriate format, etc. OSHA is evaluating available information, and expects to take regulatory action to improve the presentation of information on MSDSs at a later date.

OSHA believes that the quality of available MSDSs needs to be improved. Although implementation of the HCS has resulted in the creation of many more data sheets than were provided voluntarily, and most of these sheets are of better quality than were available prior to promulgation of the standard, there are still many which need to be improved. The accuracy and sufficiency of the information provided is one concern. Some employers have generated MSDSs to comply with the rule, but have not ensured that the information provided is adequate.

The second issue with regard to the quality of the MSDSs has to do with the presentation of the information. MSDSs now serve a multitude of purposes, being directed to employees as well as to health professionals and the community. In some cases, the language is too technical to properly communicate the necessary information. The format of the MSDSs often ''buries'' the information that is of most concern to workers (such as hazard information and protective measures).

Chemical manufacturers and importers should be carefully reviewing their MSDSs to ensure they provide accurate and useful information, and to consider whether or not they are presented in the most communicative manner. We are aware that many employers are already considering these factors. For example, many word processing programs will reveal the reading level required to understand the information presented. For those parts of the MSDS or label that are intended for workers, the reading level should be directed to a level that is appropriate for the workforce (generally sixth to eighth grade). It would also be helpful to place information intended for workers at the beginning of the sheet.

As mentioned previously, the GAO has prepared two studies of the HCS, and has made recommendations concerning MSDS requirements in a recent report (GAO/HRD–92–8). It found that MSDSs are seen by employers as being too complicated, and that OSHA's system of reviewing the accuracy of the sheets is not likely to detect systemic problems. As a result, they recommended that the standard be revised to:

> Specify that developers of MSDSs include on each data sheet a brief description of employer responsibilities under the standard, and
>
> Address the problem of employers' and employees' inability to understand the MSDSs by clearly specifying the language and presentation of information to be used on MSDSs.

The description of the standard is intended to address concerns that small businesses in particular are not aware of the requirements of the rule. OSHA will solicit comment on these suggestions at such time as the rulemaking is opened to consider changing the MSDS requirements. In addition, strategies for reviewing MSDS accuracy in compliance inspections will be reviewed.

Related to this issue regarding comprehensibility were the comments received objecting to the use of MSDSs under the rule (see, *e.g.,* Exs. 11–74, 11–78, 11–108, 11–118, 11–142). Many of these employer comments indicated that employees are not interested in the information on MSDSs, or that it is not useful to them. ''The information contained on these sheets is written by chemists and for chemists. They are much too technical for everyday use. The average employee on a home improvement job site already knows not to drink paint and not to apply hot tar to his skin.'' Ex. 11–74.

Proper implementation of the HCS results in both employers and employees being educated about the hazards of chemicals in their workplaces. Statements such as these trivialize the importance of the information conveyed. For example, many paints contain solvents that are neurotoxins. Application can generate vapors that can impair a worker's ability to function and may lead to accidents such as falling off ladders. Unfortunately, some of the comments indicate that the employers do not want more information about the chemicals they use. For example, the Coalition submitted an analysis of label information versus MSDS information for the same chemical products. Their conclusion was that MSDSs include more information, but they don't want or need it (Ex. 11–142).

This simply perpetuates the situation which necessitated the promulgation of the rule, *i.e.*, that employers do not know about the chemicals in use in their workplaces, and therefore workers are not able to learn about these materials either.

The effectiveness of a hazard communication program is directly related to the attitude and ability of the person presenting the information to the workers (see Ex. 4–75). If the trainer conveys the impression that the information is trivial, or the message is unnecessary, then the program will not be effective. (For example, a trainer for the AGC testified that: ''You need to understand that the interest level is low, the attention span is limited, and in some cases, people showed up for class, shall we just say 'under the influence'.'' Tr. 6–33. OSHA recognizes that not every employee is going to be interested in all of the information presented. However, it appears to OSHA that approaching a class with the attitude that the workers aren't interested and won't understand the information will not result in an effective program.)

Employee representatives did not indicate that employees are not interested in having access to MSDSs. In fact, the testimony and comments were quite the opposite—employee representatives emphasized that access to MSDSs is considered to be necessary. See, *e.g.*, BCTD testimony: ''* * * [L]et us repeat that the worksite is exactly where the MSDS is needed, and it is used by our members.''

OSHA believes that the fact that MSDSs need to be improved is not an indication that they should be discarded in favor of the limited information on labels. The appropriate response to the problem is to improve the MSDSs, not to remove protections from employees by limiting the information that is available to them. Furthermore, labels simply cannot provide all of the information that is required to be disclosed. The label format is limited by size, and the effectiveness of a label in serving its primary purpose—to provide an immediate visual warning—will be impeded by information overload if all possible information is required to be included on a label. Participants arguing that MSDSs have information overload have missed the key difference in the

roles of labels and MSDSs. Labels are subject to the overload argument because they are intended to provide an immediate warning—a purpose that research has shown cannot be met if there is too much information on the label. On the other hand, MSDSs are reference documents, not an immediate warning mechanism.

Some of the comments on the role of labels versus data sheets revealed a lack of information on the part of the participants regarding available research on the role of labeling. For example, one commenter indicated that there are ''hundreds'' of studies that indicate labels are effective, and thus the preferred means of transmitting information (Ex. 11–108). When asked during the hearing to provide a bibliography of these studies (Tr. 3–182), the American Dental Trade Association suggested that OSHA consult the ANSI labeling standard for such a bibliography.

The ANSI labeling standard does not contain any such information. The one study referenced is one on symbols that was conducted in conjunction with the development of the standard. That study concluded that many commonly used symbols are not well-recognized, and thus are not effectively transmitting hazard information. Based on that study, the ANSI committee decided not to include requirements for symbols in the standard. Ex. 49.

The chairman of the ANSI committee testified on behalf of the Chemical Manufacturers Association (Tr. 6–6–39). He is also chairman of the Board of a professional society (formerly the American Conference on Chemical Labeling but now the Society for Chemical Hazard Communication) of experts on labeling and material safety data sheets. OSHA asked him if he or the ANSI committee were aware of ''hundreds'' of studies regarding the effectiveness of labels, and he replied: ''No, I am not aware of any studies of that nature.'' Tr. 6–29. Mr. Talcott further indicated that ''a full hazard communication program really includes the label, a properly constructed label, but it has other parts. And the data sheet, as well as the hazard determination and training programs serve very vital parts in that full hazard communication program. And I think OSHA has properly recognized that there are multiple parts, and a label alone is not going to be a full hazard communication program.'' Tr. 6–28–29.

In fact, although there have been various labeling requirements and practices for many years, there is little evidence that labeling results in a change in behavior without the availability of other information and communication mechanisms. See Ex. 71–23A, Handbook of Chemical Industry Labeling: ''[T]he editors have found no published research which clearly isolates the effect of a given label on a specific chemical product from the effects of other factors including inserts, training, general media information, advertising and promotion or consumerist activities.''

It should also be noted that it was suggested that the labeling requirements of the ANSI standard result in enough information for workers. Yet the ANSI committee specifically addressed this issue in the preamble to the standard: ''Precautionary labels are not intended to include all information on the properties of a chemical nor the complete details of its handling under all conditions. Such information is more appropriately provided through other means, such as material safety data sheets, technical bulletins, training, or other communications intended to enhance and supplement the label.'' Ex. 49.

Clearly, the genesis of many of the comments received opposing the MSDS requirements is simply that these commenters do not want to deal with them, rather than any objective evidence that they are not necessary. As has been discussed at length in previous HCS **Federal Register** documents (see preambles to original NPRM and final rule), the effectiveness of a hazard communication program relies on the three-pronged approach in the HCS (labels, MSDSs, and training). Each serves a different purpose, and they are all interdependent on each other. No information provided during this rulemaking proceeding has altered that finding.

Comments that MSDSs are intended for manufacturing and are only useful there are not supported by evidence either (Ex. 11–104). MSDSs were first created many years ago, and were used in many different types of operations. (See Ex. 71–33, a paper on the history of the development of data sheets: ''[B]y the middle of the nineteenth century manufacturers were supplying their customers with some sort of data sheet, either along with their product or on demand * * *. The earliest example of an MSDS that I have ever seen is one by Valentine and Company of 1906.'' The first Federal requirements for MSDSs were in the maritime industries, ship building, breaking and repairing operations, and were promulgated in 1968. MSDSs have been required by various state laws in all industries for some years. International activities in the area of hazard communication also indicate that there is widespread recognition of the need for MSDS information to supplement labels (Ex. 71–12).

Thus MSDSs remain a key aspect of the regulatory approach in the HCS. Activities to improve them will be encouraged by OSHA, and further regulatory action may be taken to update the requirements at a later date.

Some minor modifications have been made to the requirements to clarify the provisions. It has come to OSHA's attention that the requirement for MSDSs to be readily available to workers when they are in their work areas during the workshift has been interpreted as meaning the MSDSs can be located elsewhere, as long as they are available through some means such as by telephone. This is not permissible under the rule. The provisions in paragraph (g)(8) state that ''the employer shall maintain copies of the required material safety data sheets for each hazardous chemical in the workplace, and shall ensure that they are readily accessible during each work shift to employees when they are in their work areas.'' The incorrect interpretations are apparently being reached by reading the phrase ''in the workplace'' as a modifier to ''hazardous chemical'', rather than as a designation as to where the MSDSs must be. In order to ensure that such misinterpretations are not perpetuated, the phrase has been reworded to indicate that ''the employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical * * *.'' In addition, paragraph (g)(1) which requires an employer to have MSDSs has been modified to include the phrase ''in the workplace.''

Paragraph (g)(8) has been further modified to indicate that ''electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to ready employee access in each workplace are created by such options.'' OSHA has always permitted such alternatives for purposes of compliance, but did receive comments that indicated not all employers were aware of these options (see, *e.g.*, Ex. 35). (See also Ex. 11–50: ''In keeping with the performance-oriented intent of the HCS U S WEST expects OSHA to allow employers flexibility in meeting the requirements of this section (e.g. allow the use of telefaxing or other data transmission means for providing access to MSDS). A particular need for flexibility must be recognized for service industries where there is frequent and varied association with multi-employer workplaces on a

daily basis.'') This modification should help ensure that employers know they can achieve compliance using these methods.

The MSDS requirements have always indicated that the documents must be in English, paragraph (g)(2). However, this was to ensure that MSDSs for imported products are not simply provided in the language of the country of origin. It was not intended to prevent translation of MSDSs into other appropriate languages. Thus this provision has been modified to indicate that the MSDSs may be available in other languages as well.

One commenter noted that the change in the hazard determination provisions regarding mixtures (changing ''hazard'' to ''risk''), needed to be made in the MSDS requirements for disclosure of chemical identity as well. Ex. 11–137. OSHA agrees, and the change has been made in paragraph (g)(2)(i)(C)(*2*). In addition, paragraph (g)(2)(i)(C)(*1*) is being technically amended to delete an inappropriate reference to paragraph (d)(4) regarding carcinogenicity. All of the hazard determination provisions apply to carcinogens, and the reference should simply be to paragraph (d).

The mobile worksite provision, paragraph (g)(9) is also being modified to take out the reference to a central location at the primary workplace facility. The MSDSs may be kept wherever the employer deems appropriate and accessible at that facility.

Employee Information and Training

OSHA did not propose to modify the information and training requirements. However, a number of comments which have been received regarding training, particularly in the construction industry, reveal a continuing lack of understanding of the requirements. OSHA has corrected these misperceptions in a number of forums, but the misinterpretations persist. Thus the Agency is modifying the requirements to ensure they are better understood.

Since 1983, the HCS has included the following provision: ''Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.'' The provisions of the paragraph further elaborate the specific information the employees must receive, and the elements to be addressed in the training program.

A substantial portion of the comments received from the construction industry maintain that the training is infeasible in their industry. This claim of infeasibility is based upon their interpretation that the employer must train each worker on the MSDS on each chemical, and thus would have to stop the work on the job each time a new contractor comes on the site with new chemicals to re-train all employees on those chemicals. (See, *e.g.,* Exs. 11–6, 11–15, 11–73, 11–98, 11–142.)

In fact, the information and training requirements are flexible, and do not specify how the training is to be accomplished. If an employer only has a few chemicals, it may be most useful to individually review each one in the workplace. However, where there are many chemicals, and the chemicals change frequently, it would be more appropriate to train workers regarding all types of hazards, by categories, rather than addressing each individual substance. The chemical-specific information will always be available to the workers on the labels and the data sheets.

The re-training required by the rule is when a new hazard is brought into the workplace, not a new chemical. If a new chemical is flammable, and the employer has already trained regarding flammability, there is no re-training required. If a new chemical is carcinogenic, and that type of hazard was not addressed in the employee's training, then re-training is required.

As was noted in the NPRM, the construction industry is unique among the non-manufacturing industries because there are long-standing requirements for regular training regarding hazardous chemicals. Relevant paragraphs of 29 CFR 1926.21 state that:

> The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.
>
> Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required * * *.
>
> Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in subparts D, F, and other applicable subparts of this part.

OSHA would like to reiterate that employers who are in compliance with these provisions as required are substantially in compliance with the HCS training provisions as well. The HCS simply requires that construction employers supplement these already established training programs with the additional information required by the HCS, such as the existence of the rule and the use and availability of labels and MSDSs.

Coverage of construction employers under the HCS will enable them to provide more effective training under the construction rules because the HCS will ensure they are provided with necessary substance-specific information upon which to base an appropriate training program. It will also enable them to select more appropriate protective measures for the hazardous chemicals on their sites. As has been previously cited, the Advisory Committee on Construction Safety and Health has long recognized the construction employers' decreased ability to properly transmit hazard information and design appropriate protective measures without the labels and MSDSs for the specific products (Ex. 4–4).

Effective date. The changes being promulgated in this final rule are minor, and do not require any additional employer actions to comply. Therefore, there is no need for an extended period for compliance, and the changes will become effective 30 days after publication of the rule.

Appendix A. This appendix has only been modified in one respect to clarify the intent. The specific definitions of hazards which are included in this appendix were never intended to be a categorization scheme for hazards. If a substance meets one of these definitions, it is definitely covered by the rule. However, if it does not, the employer is still required to evaluate the validity of any other available data in accordance with the requirements of the rule. This is now stated in Appendix A as a clarification.

Appendix B. A statement regarding the need to evaluate all data on carcinogenicity, besides the referenced sources, has also been added for clarification to Appendix B. In addition, a statement regarding short-term tests has been added. Short-term tests (i.e., *in vitro* studies) were not specifically addressed in the final rule, but it is OSHA's determination that they generally would not provide results which can be analyzed for statistical significance, and thus would not meet the requirements of the rule for such a finding.

Addition of Appendix E. OSHA published a new nonmandatory appendix in the NPRM to provide additional guidance to employers complying with the HCS, and is adopting it in this final rule. The appendix suggests the steps an

employer using chemicals should follow to achieve compliance, and provides some information regarding how OSHA will be enforcing the requirements of the HCS. A reference to Appendix E has also been added to the scope and application (paragraph (b)(1)) to direct employers to the guidance it provides. OSHA believes this appendix will assist employers to design and implement effective programs.

Although a number of comments received after the revised final rule was published in 1987 stressed the need for guidance or outreach materials (see, *e.g.*, 11–74, 11–104, 11–123, 11–141), few of those previously interested parties commented on the new appendix or its contents. Those who did comment were generally supportive, and believed it would be helpful to employers (Exs. 11–10, 11–34, 11–38, 11–40, and 11–90).

One chemical manufacturer suggested that OSHA should not encourage employers to discard any MSDSs, whether the chemical is hazardous or not (Ex. 11–10). Although OSHA agrees in a general sense that having information regarding the absence of hazards is useful, the rule's coverage is limited to hazardous chemicals to which employees are potentially exposed. The proliferation of MSDSs on products for which they are clearly not necessary (such as floor mats and hard hats) dilutes the attention that should properly be paid to those products that are covered.

There were suggestions that a reference to the American National Standards Institute (ANSI) standard for labeling be included in Appendix E (Exs. 11–51 and 11–90). As this appendix is intended for employers who use chemicals, rather than employers who evaluate hazards and prepare labels, this suggestion does not appear to be appropriate.

There was also a suggestion that a specific appendix is needed for agriculture (Ex. 11–67). OSHA believes that the generic guidance can be successfully used to assist all types of industries.

In order to make Appendix E more widely available, OSHA has published it in a separate booklet, OSHA 3111, Hazard Communication Guidelines for Compliance. A single copy may be obtained from OSHA's Publications Office, (202) 523–9667.

IV. Analyses of Regulatory Impact, Regulatory Flexibility, and Environmental Impact

Executive Order 12866 (58 FR 51735, Sept. 30, 1993) requires that a regulatory impact analysis be conducted for any rule having major economic consequences on the national economy, individual industries, geographical regions, or levels of government. The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) similarly requires the Occupational Safety and Health Administration (OSHA) to consider the impact of a regulation on small entities.

The current final rule is merely a minor revision of the HCS which already applies to all industrial sectors where workers are exposed to hazardous chemicals. This revision is not a major or significant rule, thus no additional regulatory impact analysis is necessary. As noted in the NPRM (53 FR 29846–49), the analyses performed prior to publication of the 1987 final rule, which is currently being enforced, are not being revised. However, as comments were submitted concerning the costs of the current provisions, OSHA is taking this opportunity to briefly discuss some of the issues that have been raised.

As was the case with comments submitted subsequent to the publication of the 1987 final rule, most of these comments either provided no specific data or evidence regarding either the costs or the analysis, or rather simply provided cost summaries with no indication of methodology or substantiation of unit assumptions. Others provided cost estimates that were clearly unrealistic or based on false premises in terms of the actual requirements of the rule. OSHA maintains that the economic methodology used in the analysis was appropriate, and the costs were based on reasonable assumptions. Information submitted subsequent to that analysis have not persuaded OSHA that the cost analyses were unreasonable.

For example, as noted in the preamble to the NPRM, the Small Business Administration (SBA) and others criticized the estimates of products covered per firm. In particular, the use of the National Occupational Exposures Survey (NOES) data was considered by some to be inappropriate. Although OSHA has already shown that these criticisms were not valid (53 FR 29846–49), a few more points on the subject are in order.

As indicated previously, the data used from the NOES are averages. OSHA expected that some establishments in the nonmanufacturing industries will maintain more MSDSs than the average, just as some establishments will maintain fewer. Consequently, examples of firms with more than the average number of chemicals do not invalidate the survey (see Ex. 5–93). Furthermore, it should be noted that OSHA's estimates are for the number of hazardous chemical products at a facility or site, not for an inventory of all the chemicals a firm may have at multiple sites. The HCS also only requires that a firm maintain one MSDS for a particular chemical—where multiple suppliers are used, the chemical is only counted once.

The construction industry in particular claimed that the number of chemical products used in the estimates was too low. In general, estimates OSHA used varied by the size of the firm and the two-digit SIC code, but were approximately 12 products per firm per site (and an estimate of 3 ongoing sites for each firm at any given time). The Coalition (Ex. 11–142) submitted an actual count of products at a home building site per subcontractor. The average number per contractor per site was 8 (4 less than the OSHA average), although the number varied from 1 to 90. Only 5 of the 38 subcontractors had more than the average of 12 estimated by OSHA. The total number of MSDSs for this site was 302 (763 pages), which could easily fit in one file drawer on the site.

The Coalition still maintains OSHA's numbers are faulty, but could not explain why the data they submitted did not support their own contention in this regard (Tr. 5–56–7).

Similarly, AGC surveyed their members and received responses regarding number of MSDSs required (Ex. 11–135). The numbers varied from 10 to 525. However, it appears that these product counts are for the firm, and not for each job. And some of the commenters admitted that they send MSDSs to the site for chemicals that are not there so they do not have to sort the MSDSs in any fashion. In any event, even the largest reported number (525) for a firm (not a site) is substantially smaller than earlier claims of ''thousands'' (Ex. 5–76). Although 525 is a substantial number of MSDSs, they will fit in a space less than the size of a file drawer. This is also a quite smaller volume than claims that construction firms would need a separate office building to maintain MSDSs on a site (Ex. 5–76).

Actual community right-to-know reporting data from nonmanufacturing firms in Los Angeles also confirm that OSHA's estimates of products per firm are reasonable (Ex. 4–187).

The cost information submitted to the OSHA docket after the current rule was published does not provide sufficient evidence for OSHA to conclude that the Hazard Communication Standard that is currently being enforced is infeasible in any industry. (In fact, much of it does not include any information about how the costs were calculated.) As described

in the NPRM, there have been claims from the construction industry that costs were underestimated by OSHA and the rule is therefore infeasible for this industry to comply with (see, *e.g.,* Exs. 5–65, 5–83, and 5–86). Additional comments were received in response to the NPRM (see, e.g., 11–135, 11–142). However, many firms in the construction industry have been subject to state hazard communication laws for the last several years. Evidence on enforcement activities in several of those states indicate that construction firms are able to comply. The construction industry has also been subject for many years to the requirements of 29 CFR 1926.21, which establishes the obligation to train construction workers in the recognition and the safe handling of hazardous substances. In this regard the Hazard Communication Standard has added very few additional training responsibilities. OSHA's cost estimates focus only on new duties, not on the burdens of pre-existing standards. So the cost estimate for the expanded rule does not assume the costs for training that should have been conducted to comply with § 1926.21. Employers who were not in compliance with that rule, or with the requirements of the states they are operating in, will have to spend more to comply than has been estimated. However, that is not a cost that is attributable to the HCS.

As the Agency has indicated before, the cost estimates were based on the best available information, and are averages. Firms will be expected to have costs both above and below the figures estimated. As long as estimates are based on reasonable assumptions and cost figures, the Agency has satisfied its analysis requirements to assure the rule is economically feasible. If OSHA were to rely on some or all of the assertions in the record regarding estimates of time involved in complying with the Standard, and estimates of the number of MSDSs which would be generated by the imposition of the Standard, the Standard would still be feasible in every SIC. Consequently, OSHA finds that claims of infeasible costs are not substantiated by any analysis or evidence, and that nothing in the record supports a conclusion of infeasibility in any SIC regulated under the existing rule.

Many of the claimed costs were also based on misinterpretations of the rule. As noted earlier in this preamble, for example, the Coalition cost estimates for a firm were based largely on accomplishment of activities that were not required to comply. Ex. 11–142. The results were therefore unrealistically inflated from what costs might actually be expected to occur.

OSHA expects that the limited modifications being promulgated in this final rule will not eliminate protections of the rule, but may make the standard more cost-effective. OSHA does not consider this NPRM to be either a major or significant rule. In addition, the changes are too subtle for the economic model to be able to reflect the decreases in the costs. However, it is expected that if the proposed changes are implemented the costs will be somewhat reduced.

With regard to criticisms of the cost methodology used by OSHA, the GAO has reviewed it at the request of Congress and concluded that OSHA's general approach to estimating the costs of compliance with the HCS requirements is fundamentally sound. It noted that the cost estimates derived would vary based on differences in assumptions regarding parameters. (GAO/HRD–92–63BR).

Regulatory Flexibility Analysis

Under the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.,* the Assistant Secretary certifies that modifications to the existing HCS contained in this final rule will not have a significant economic impact on a substantial number of small entities. This final rule has not substantively changed the HCS promulgated on August 24, 1987. The changes do not eliminate protections already provided by the rule, but simply clarify the rule to enhance compliance and thereby further improve employee protections. As noted in the discussion above regarding the regulatory impact analysis, the changes are too subtle to be quantified by the economic model used to calculate compliance costs of the HCS. It is expected, however, that if the proposed changes are implemented, the compliance costs would be somewhat reduced for small businesses.

A regulatory impact and regulatory flexibility analysis was prepared by OSHA for the August 1987 revised HCS (Exs. 4–1 and 4–2). See also 52 FR 31867–76 (summary of analyses). OSHA analyzed the impact of expanding the coverage of the HCS from the manufacturing sector to all employers within OSHA's jurisdiction. Economic impacts were analyzed for each provision of the rule; for each of fifty business classifications as indicated by their two-digit Standard Industrial Classification Codes; and for four employment size classes (1–19; 20–99; 100–249; and greater than 250). The majority of non-manufacturers are small businesses with fewer than 20 employees, and the effects of the HCS on small businesses were analyzed. *Id.* at 31869, 75–76 (tables 9 and 10). It should be noted, however, that although a particular workplace may be considered a small business based upon the number of employees at that site, many of these businesses are actually part of large corporations with significant safety and health resources (*e.g.,* fast food franchises, retail store chains). OSHA's analyses indicated that the HCS's compliance costs would be a negligible percentage (less than one-half of one percent) of the typical small business' average annual revenue. *Id.* at 31869, 75 (table 9). In addition, no disproportionate impact was foreseen for small businesses when compared to large businesses. *Id.* at 31870, 75–76 (table 10).

OSHA believes that it has minimized the economic impact of the HCS on small entities in accordance with the Regulatory Flexibility Act, while accomplishing the objectives of the OSH Act. The HCS is a performance-oriented rule which benefits small employers by allowing them to choose compliance methods best suited for their individual workplaces. The HCS is also tailored for some work operations found in small businesses to ensure that the standard is practical and cost-effective in communicating hazards to workers. See, *e.g.,* 29 CFR 1910.1200(b)(3), (laboratories); (b)(4), (handling of sealed containers); (b)(5), (container labeling exemptions); (b)(6), (products totally exempted). See also 52 FR 31858. In addition, OSHA-developed compliance guidelines, such as the new Appendix E to the rule, and the compliance kit available from GPO (OSHA 3104), will directly benefit small businesses by clarifying and simplifying compliance efforts.

Environmental Assessment—Finding of No Significant Impact

In accordance with the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality guidelines (40 CFR part 1500), and the Department of Labor regulations (29 CFR part 11), the Assistant Secretary for OSHA has determined that this final rule will not have a significant environmental impact. As concluded previously, the current standard will not significantly affect the quality of the human environment outside the workplace. 52 FR 31870; 48 FR 53333–34. Labeling of containers will not have a direct or significant impact on air or water quality, land or energy use, or solid waste disposal outside of the workplace. Similarly, the requirements for preparation of a written compliance

plan, provision and maintenance of MSDSs, and provision of information and training should not have an adverse environmental impact. Accordingly, this document's modifications to the HCS also will not have a significant impact on the environment outside the workplace.

V. Clearance of Information Collection Requirements

On March 31, 1983, the Office of Management and Budget (OMB) published a new 5 CFR part 1320, implementing the information collection provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* (48 FR 13666). Part 1320, which became effective on April 30, 1983, sets forth procedures for agencies to follow in obtaining OMB clearance for information collection requirements.

In accordance with the provisions of the Paperwork Act and the regulations issued pursuant thereto, OSHA certifies that it submitted the information collection requirements contained in the HCS to OMB for review under section 3504(h) of that Act. In June 1991, OMB extended its approval of the information collection requirements through April 1994. There are no changes in this modified final rule which affect those requirements or change the burden of the requirements. The OMB Control No. is 1218–0072.

VI. Federalism and State Plan Applicability

This final standard has been reviewed in accordance with Executive Order 12612, 52 FR 41685 (October 30, 1987), regarding Federalism. This Order requires that agencies, to the extent possible, refrain from limiting state policy options, consult with States prior to taking any actions that would restrict State policy options, and take such actions only when there is clear constitutional authority and the presence of a problem of national scope. The Order provides for preemption of State law only if there is a clear Congressional intent for the agency to do so. Any such preemption is to be limited to the extent possible.

Section 18 of the Occupational Safety and Health Act (OSH Act), expresses Congress' clear intent to preempt State laws with respect to which Federal OSHA has promulgated occupational safety or health standards. Under the OSH Act, a State can avoid preemption only if it submits, and obtains Federal approval of, a plan for the development of such standards and their enforcement. Occupational safety and health standards developed by such Plan—States must, among other things, be at least as effective as the Federal standards in providing safe and healthful employment and places of employment.

Those States which have elected to participate under Section 18 of the OSH Act would not be preempted by this regulation and would be able to deal with special, local conditions within the framework provided by this performance-oriented standard while ensuring that their standards are at least as effective as the Federal standard.

The 25 States with their own OSHA-approved occupational safety and health plans must adopt a comparable standard within six months of the publication date of a final standard. These States include: Alaska, Arizona, California, Connecticut (for State and local government employees only), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York (for State and local government employees only), North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. Until such time as a State standard is promulgated, Federal OSHA will provide interim enforcement assistance, as appropriate.

Although a State HCS becomes effective in accordance with State promulgation provisions, and is enforceable upon promulgation, OSHA must also review and approve the standard to assure that it is ''at least as effective'' as the Federal standard. OSHA intends to closely scrutinize State standards submitted under current or future State plans to assure not only equal or greater effectiveness, but also that any additional requirements do not conflict with, or adversely affect, the effectiveness of the national application of OSHA's standard. Because the HCS is ''applicable to products'' in that it permits the distribution and use of hazardous chemicals in commerce only if they are in labeled containers accompanied by material safety data sheets, OSHA must determine in its review whether any State plan standard provisions which differ from the Federal are ''required by compelling local conditions and do not unduly burden interstate commerce.'' Section 18(c) of the Act, 29 U.S.C. 667(c).

VII. Authority, Signature, and the Final Rule

This document was prepared under the direction of Joseph A. Dear, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue NW., Washington, DC 20210.

For the reasons set out in the preamble, and under the authority of section 41 of the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941), section 107 of the Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333), sections 4, 6 and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657), Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), or 1–90 (55 FR 8033) as applicable, and 29 CFR part 1911, and 5 U.S.C. 553, the Occupational Safety and Health Administration hereby amends parts 1910, 1915, 1917, 1918, 1926, and 1928 of Title 29 of the Code of Federal Regulations, as set forth below.

List of Subjects in 29 CFR Parts 1910, 1915, 1917, 1918, 1926, and 1928

Hazard communication; Occupational safety and health; Right-to-know; Labeling; Material safety data sheets; Employee training.

Signed at Washington, DC, this 26th day of January 1994.

Joseph A. Dear,

Assistant Secretary for Occupational Safety and Health.

OSHA is amending parts 1910, 1915, 1917, 1918, 1926, and 1928 of title 29 of the Code of Federal Regulations as follows:

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

PART 1915—OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR SHIPYARD EMPLOYMENT

PART 1917—MARINE TERMINALS

PART 1918—SAFETY AND HEALTH REGULATIONS FOR LONGSHORING

PART 1926—SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

PART 1928—OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR AGRICULTURE

PART 1910—[AMENDED]

1. The authority citation for subpart Z of part 1910 continues to read as follows:

Authority: Secs. 6,8 Occupational Safety and Health Act, 29 U.S.C. 655, 657: Secretary of Labor's Order 12–71 (36 FR 8754), 9–76 (41 FR 25059), 9–83 (48 FR 35736) or 1–90 (55 FR 9033), as applicable; and 29 CFR part 1911.

All of subpart Z issued under section 6(b) of the Occupational Safety and Health Act,

except those substances which have exposure limits listed in Tables Z–1, Z–2 and Z–3 of 29 CFR 1910.1000. The latter were issued under section 6(a) (29 U.S.C. 655(a)).

Section 1910.1000, Tables Z–1, Z–2 and Z–3 also issued under 5 U.S.C. 553. Section 1910.1000, Tables Z–1, Z–2 and Z–3 not issued under 29 CFR part 1911 except for the arsenic (organic compounds), benzene, and cotton dust listings.

Section 1910.1001 also issued under Sec. 107 of the Contract Work Hours and Safety Standards Act, 40 U.S.C. 333.

Section 1910.1002 not issued under 29 U.S.C 655 or 29 CFR part 1911; also issued under 5 U.S.C. 553.

Section 1910.1025 also issued under 5 U.S.C. 553.

Section 1910.1043 also issued under 5 U.S.C. 551 *et seq.*

Sections 1910.1200, 1910.1499 and 1910.1500 also issued under 5 U.S.C. 553.

PART 1915—[AMENDED]

2. The authority citation for part 1915 continues to read as follows:

Authority: Sec. 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), or 1–90 (55 FR 9033), as applicable; 29 CFR part 1911.

Section 1915.99 also issued under 5 U.S.C. 553.

PART 1917—[AMENDED]

3. The authority citation for part 1917 continues to read as follows:

Authority: Sec. 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), or 1–90 (55 FR 9033), as applicable; 29 CFR part 1911.

Section 1917.28 also issued under 5 U.S.C. 553.

PART 1918—[AMENDED]

4. The authority citation for part 1918 continues to read as follows:

Authority: Sec. 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), or 1–90 (55 FR 9033), as applicable.

Section 1918.90 also issued under 5 U.S.C. 553 and 29 CFR part 1911.

5. The authority citation for subpart D of part 1926 continues to read as follows:

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), or 1–90 (55 FR 9033), as applicable.

Section 1926.59 also issued under 5 U.S.C. 553 and 29 CFR part 1911.

PART 1928—[AMENDED]

6. The authority citation for part 1928 continues to read as follows:

Authority: Secs. 6 and 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), or 1–90 (55 FR 9033), as applicable; 29 CFR part 1911.

Section 1928.21 also issued under 5 U.S.C. 553.

7. Parts 1910, 1915, 1917, 1918, and 1926 are amended by revising §§ 1910.1200, 1915.1200, 1917.28 and 1918.90, and 1926.59 to contain the identical text, including Appendices A, B, C, D, and E, to read as follows:

§ _____ Hazard communication.

(a) *Purpose.* (1) The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

(2) This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or political subdivision of a state, pertaining to this subject. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures. Under section 18 of the Act, no state or political subdivision of a state may adopt or enforce, through any court or agency, any requirement relating to the issue addressed by this Federal standard, except pursuant to a Federally-approved state plan.

(b) *Scope and application.* (1) This section requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this section requires distributors to transmit the required information to employers. (Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers. Appendix E of this section is a general guide for such employers to help them determine their compliance obligations under the rule.)

(2) This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

(3) This section applies to laboratories only as follows:

(i) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(ii) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible during each workshift to laboratory employees when they are in their work areas;

(iii) Employers shall ensure that laboratory employees are provided information and training in accordance with paragraph (h) of this section, except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section; and,

(iv) Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule, and thus must ensure that any containers of hazardous chemicals leaving the laboratory are labeled in accordance with paragraph (f)(1) of this section, and that a material safety data sheet is provided to distributors and other employers in accordance with paragraphs (g)(6) and (g)(7) of this section.

(4) In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

(i) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(ii) Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and,

(iii) Employers shall ensure that employees are provided with information and training in accordance with paragraph (h) of this section (except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

(5) This section does not require labeling of the following chemicals:

(i) Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 *et seq.*), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

(ii) Any chemical substance or mixture as such terms are defined in the Toxic Substances Control Act (15 U.S.C. 2601 *et seq.*), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

(iii) Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (*e.g.* flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 *et seq.*) or the Virus-Serum-Toxin Act of 1913 (21 U.S.C. 151 *et seq.*), and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or the Department of Agriculture;

(iv) Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 *et seq.*) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms;

(v) Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*) and Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and,

(vi) Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 *et seq.*) and the labeling regulations issued under that Act by the Department of Agriculture.

(6) This section does not apply to: (i) Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 *et seq.*), when subject to regulations issued under that Act by the Environmental Protection Agency;

(ii) Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)(42 U.S.C. 9601 *et seq.*), when subject to regulations issued under that Act by the Environmental Protection Agency;

(iii) Tobacco or tobacco products;

(iv) Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);

(v) Articles (as that term is defined in paragraph (c) of this section);

(vi) Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;

(vii) Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 *et seq.*), when it is in solid, final form for direct administration to the patient (*e.g.*, tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (*e.g.*, over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (*e.g.*, first aid supplies);

(viii) Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

(ix) Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*) and Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

(x) Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section;

(xi) Ionizing and nonionizing radiation; and,

(xii) Biological hazards.

(c) *Definitions.*

Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, *e.g.,* minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Chemical means any element, chemical compound or mixture of elements and/or compounds.

Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.

Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or

the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Combustible liquid means any liquid having a flashpoint at or above 100 °F (37.8 °C), but below 200 °F (93.3 °C), except any mixture having components with flashpoints of 200 °F (93.3 °C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Commercial account means an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

Compressed gas means:

(i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 °F (21.1 °C); or

(ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 °F (54.4 °C) regardless of the pressure at 70 °F (21.1 °C); or

(iii) A liquid having a vapor pressure exceeding 40 psi at 100 °F (37.8 °C) as determined by ASTM D–323–72.

Container means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

Director means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

Employee means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

Employer means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Exposure or *exposed* means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (*e.g.* accidental or possible) exposure. ''Subjected'' in terms of health hazards includes any route of entry (*e.g.* inhalation, ingestion, skin contact or absorption.)

Flammable means a chemical that falls into one of the following categories:

(i) *Aerosol, flammable* means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) *Gas, flammable* means: (A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;

(iii) *Liquid, flammable* means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) *Solid, flammable* means a solid, other than a blasting agent or explosive as defined in § 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24–1979 (ASTM D 56–79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7–1979 (ASTM D 93–79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278–78)).

Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

Hazardous chemical means any chemical which is a physical hazard or a health hazard.

Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the specific physical or health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for ''physical hazard'' and ''health hazard'' to determine the hazards which must be covered.)

Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term ''health hazard'' includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be

considered hazardous for purposes of this standard.

Identity means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

Immediate use means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Importer means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

Label means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Material safety data sheet (MSDS) means written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of this section.

Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

Organic peroxide means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer means a chemical other than a blasting agent or explosive as defined in § 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

Produce means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

Pyrophoric means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D sets out the criteria to be used in evaluating trade secrets.

Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Use means to package, handle, react, emit, extract, generate as a byproduct, or transfer.

Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

Workplace means an establishment, job site, or project, at one geographical location containing one or more work areas.

(d) *Hazard determination.* (1) Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

(2) Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

(3) The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

(i) 29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or,

(ii) *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment,* American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition). The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of this standard.

(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(i) National Toxicology Program (NTP), *Annual Report on Carcinogens* (latest edition);

(ii) International Agency for Research on Cancer (IARC) *Monographs* (latest editions); or

(iii) 29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Note: The *Registry of Toxic Effects of Chemical Substances* published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

(5) The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

(i) If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

(ii) If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under paragraph (d)(4) of this section;

(iii) If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

(iv) If the chemical manufacturer, importer, or employer has evidence to

indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

(6) Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director. The written description may be incorporated into the written hazard communication program required under paragraph (e) of this section.

(e) *Written hazard communication program.* (1) Employers shall develop, implement, and maintain at each workplace, a written hazard communication program which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

(i) A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,

(ii) The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

(2) *Multi-employer workplaces.* Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:

(i) The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;

(ii) The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,

(iii) The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

(3) The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this paragraph (e).

(4) The employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1910.20 (e).

(5) Where employees must travel between workplaces during a workshift, *i.e.,* their work is carried out at more than one geographical location, the written hazard communication program may be kept at the primary workplace facility.

(f) *Labels and other forms of warning.* (1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

(i) Identity of the hazardous chemical(s);

(ii) Appropriate hazard warnings; and

(iii) Name and address of the chemical manufacturer, importer, or other responsible party.

(2)(i) For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

(ii) The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment; and,

(iii) This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).

(3) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 *et seq.*) and regulations issued under that Act by the Department of Transportation.

(4) If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(5) Except as provided in paragraphs (f)(6) and (f)(7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

(i) Identity of the hazardous chemical(s) contained therein; and,

(ii) Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

(6) The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(7) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

(8) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(9) The employer shall ensure that labels or other forms of warning are

legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

(10) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

(11) Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.

(g) *Material safety data sheets.* (1) Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use.

(2) Each material safety data sheet shall be in English (although the employer may maintain copies in other languages as well), and shall contain at least the following information:

(i) The identity used on the label, and, except as provided for in paragraph (i) of this section on trade secrets:

(A) If the hazardous chemical is a single substance, its chemical and common name(s);

(B) If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,

(C) If the hazardous chemical is a mixture which has not been tested as a whole:

(*1*) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d) of this section shall be listed if the concentrations are 0.1% or greater; and,

(*2*) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than 1% (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and,

(*3*) The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

(ii) Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

(iii) The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

(iv) The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

(v) The primary route(s) of entry;

(vi) The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

(vii) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA;

(viii) Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

(ix) Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

(x) Emergency and first aid procedures;

(xi) The date of preparation of the material safety data sheet or the last change to it; and,

(xii) The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(3) If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

(4) Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

(5) The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

(6)(i) Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated;

(ii) The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;

(iii) If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible; and,

(iv) The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

(7)(i) Distributors shall ensure that material safety data sheets, and updated

information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated;

(ii) The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment;

(iii) Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available;

(iv) Wholesale distributors selling hazardous chemicals to employers over-the-counter may also, as an alternative to keeping a file of material safety data sheets for all hazardous chemicals they sell, provide material safety data sheets upon the request of the employer at the time of the over-the-counter purchase, and shall post a sign or otherwise inform such employers that a material safety data sheet is available;

(v) If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (*i.e.*, the retail distributor does not have commercial accounts and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained;

(vi) Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request; and,

(vii) Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

(8) The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

(9) Where employees must travel between workplaces during a workshift, *i.e.*, their work is carried out at more than one geographical location, the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

(10) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in in their work area(s).

(11) Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.20(e). The Director shall also be given access to material safety data sheets in the same manner.

(h) *Employee information and training.* (1) Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (*e.g.*, flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

(2) *Information.* Employees shall be informed of:

(i) The requirements of this section;

(ii) Any operations in their work area where hazardous chemicals are present; and,

(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

(3) *Training.* Employee training shall include at least:

(i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(ii) The physical and health hazards of the chemicals in the work area;

(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

(i) *Trade secrets.* (1) The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

(i) The claim that the information withheld is a trade secret can be supported;

(ii) Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

(iii) The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

(iv) The specific chemical identity is made available to health professionals, employees, and designated representatives in accordance with the applicable provisions of this paragraph.

(2) Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (i) (3) and (4) of this section, as soon as circumstances permit.

(3) In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (i)(1) of this section, to a health professional (i.e. physician, industrial hygienist, toxicologist, epidemiologist, or occupational health

nurse) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

(i) The request is in writing;

(ii) The request describes with reasonable detail one or more of the following occupational health needs for the information:

(A) To assess the hazards of the chemicals to which employees will be exposed;

(B) To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

(C) To conduct pre-assignment or periodic medical surveillance of exposed employees;

(D) To provide medical treatment to exposed employees;

(E) To select or assess appropriate personal protective equipment for exposed employees;

(F) To design or assess engineering controls or other protective measures for exposed employees; and,

(G) To conduct studies to determine the health effects of exposure.

(iii) The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representative, would not satisfy the purposes described in paragraph (i)(3)(ii) of this section:

(A) The properties and effects of the chemical;

(B) Measures for controlling workers' exposure to the chemical;

(C) Methods of monitoring and analyzing worker exposure to the chemical; and,

(D) Methods of diagnosing and treating harmful exposures to the chemical;

(iv) The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

(v) The health professional, and the employer or contractor of the services of the health professional (i.e. downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional, employee, or designated representative, will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (i)(6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

(4) The confidentiality agreement authorized by paragraph (i)(3)(iv) of this section:

(i) May restrict the use of the information to the health purposes indicated in the written statement of need;

(ii) May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

(iii) May not include requirements for the posting of a penalty bond.

(5) Nothing in this standard is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

(6) If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

(7) If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

(i) Be provided to the health professional, employee, or designated representative, within thirty days of the request;

(ii) Be in writing;

(iii) Include evidence to support the claim that the specific chemical identity is a trade secret;

(iv) State the specific reasons why the request is being denied; and,

(v) Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

(8) The health professional, employee, or designated representative whose request for information is denied under paragraph (i)(3) of this section may refer the request and the written denial of the request to OSHA for consideration.

(9) When a health professional, employee, or designated representative refers the denial to OSHA under paragraph (i)(8) of this section, OSHA shall consider the evidence to determine if:

(i) The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

(ii) The health professional, employee, or designated representative has supported the claim that there is a medical or occupational health need for the information; and,

(iii) The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

(10)(i) If OSHA determines that the specific chemical identity requested under paragraph (i)(3) of this section is not a *bona fide* trade secret, or that it is a trade secret, but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by OSHA.

(ii) If a chemical manufacturer, importer, or employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

(11) If a citation for a failure to release specific chemical identity information is contested by the chemical manufacturer, importer, or employer, the matter will be adjudicated before the Occupational Safety and Health Review Commission in accordance with the Act's enforcement scheme and the applicable Commission rules of procedure. In accordance with the Commission rules, when a chemical manufacturer, importer, or employer continues to withhold the information during the contest, the Administrative Law Judge may review the citation and supporting documentation *in camera* or issue appropriate orders to protect the confidentiality of such matters.

(12) Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

(13) Nothing in this paragraph shall be construed as requiring the disclosure

under any circumstances of process or percentage of mixture information which is a trade secret.

(j) *Effective dates.* Chemical manufacturers, importers, distributors, and employers shall be in compliance with all provisions of this section by March 11, 1994.

Appendix A to § —Health Hazard Definitions (Mandatory)

Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g. flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body—such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees—such as shortness of breath, a non-measurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms ''acute'' and ''chronic'' are used to delineate between effects on the basis of severity or duration. ''Acute'' effects usually occur rapidly as a result of short-term exposures, and are of short duration. ''Chronic'' effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1–1988)—irritation, corrosivity, sensitization and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposure, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and protected from them. Appendix B, which is also mandatory, outlines the principles and procedures of hazard assessment.

For purposes of this section, any chemicals which meet any of the following definitions, as determined by the criteria set forth in Appendix B are health hazards. However, this is not intended to be an exclusive categorization scheme. If there are available scientific data that involve other animal species or test methods, they must also be evaluated to determine the applicability of the HCS.

1. *Carcinogen:* A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or

(b) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or,

(c) It is regulated by OSHA as a carcinogen.

2. *Corrosive:* A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described by the U.S. Department of Transportation in appendix A to 49 CFR part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

3. *Highly toxic:* A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD_{50}) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD_{50}) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC_{50}) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

4. *Irritant:* A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

5. *Sensitizer:* A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

6. *Toxic.* A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD_{50}) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD_{50}) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC_{50}) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

7. *Target organ effects.*

The following is a target organ categorization of effects which may occur, including examples of signs and symptoms and chemicals which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.

a. Hepatotoxins: Chemicals which produce liver damage
   Signs & Symptoms: Jaundice; liver enlargement
   Chemicals: Carbon tetrachloride; nitrosamines

b. Nephrotoxins: Chemicals which produce kidney damage
   Signs & Symptoms: Edema; proteinuria
   Chemicals: Halogenated hydrocarbons; uranium

c. Neurotoxins: Chemicals which produce their primary toxic effects on the nervous system
   Signs & Symptoms: Narcosis; behavioral changes; decrease in motor functions
   Chemicals: Mercury; carbon disulfide

d. Agents which act on the blood or hemato-poietic system: Decrease hemoglobin function; deprive the body tissues of oxygen
   Signs & Symptoms: Cyanosis; loss of consciousness
   Chemicals: Carbon monoxide; cyanides

e. Agents which damage the lung: Chemicals which irritate or damage pulmonary tissue
   Signs & Symptoms: Cough; tightness in chest; shortness of breath

Chemicals: Silica; asbestos

f. Reproductive toxins: Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis)
Signs & Symptoms: Birth defects; sterility
Chemicals: Lead; DBCP

g. Cutaneous hazards: Chemicals which affect the dermal layer of the body
Signs & Symptoms: Defatting of the skin; rashes; irritation
Chemicals: Ketones; chlorinated compounds

h. Eye hazards: Chemicals which affect the eye or visual capacity
Signs & Symptoms: Conjunctivitis; corneal damage
Chemicals: Organic solvents; acids

Appendix B to § —Hazard Determination (*Mandatory*)

The quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination. The hazard determination requirement of this standard is performance-oriented. Chemical manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, but they must be able to demonstrate that they have adequately ascertained the hazards of the chemicals produced or imported in accordance with the criteria set forth in this Appendix.

Hazard evaluation is a process which relies heavily on the professional judgment of the evaluator, particularly in the area of chronic hazards. The performance-orientation of the hazard determination does not diminish the duty of the chemical manufacturer, importer or employer to conduct a thorough evaluation, examining all relevant data and producing a scientifically defensible evaluation. For purposes of this standard, the following criteria shall be used in making hazard determinations that meet the requirements of this standard.

1. *Carcinogenicity:* As described in paragraph (d)(4) of this section and Appendix A of this section, a determination by the National Toxicology Program, the International Agency for Research on Cancer, or OSHA that a chemical is a carcinogen or potential carcinogen will be considered conclusive evidence for purposes of this section. In addition, however, all available scientific data on carcinogenicity must be evaluated in accordance with the provisions of this Appendix and the requirements of the rule.

2. *Human data:* Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation.

3. *Animal data:* Human evidence of health effects in exposed populations is generally not available for the majority of chemicals produced or used in the workplace. Therefore, the available results of toxicological testing in animal populations shall be used to predict the health effects that may be experienced by exposed workers. In particular, the definitions of certain acute hazards refer to specific animal testing results (see Appendix A).

4. *Adequacy and reporting of data.* The results of any studies which are designed and conducted according to established scientific principles, and which report statistically significant conclusions regarding the health effects of a chemical, shall be a sufficient basis for a hazard determination and reported on any material safety data sheet. *In vitro* studies alone generally do not form the basis for a definitive finding of hazard under the HCS since they have a positive or negative result rather than a statistically significant finding.

The chemical manufacturer, importer, or employer may also report the results of other scientifically valid studies which tend to refute the findings of hazard.

Appendix C to § _____—Information Sources (Advisory)

The following is a list of available data sources which the chemical manufacturer, importer, distributor, or employer may wish to consult to evaluate the hazards of chemicals they produce or import:

—Any information in their own company files, such as toxicity testing results or illness experience of company employees.
—Any information obtained from the supplier of the chemical, such as material safety data sheets or product safety bulletins.
—Any pertinent information obtained from the following source list (latest editions should be used):

Condensed Chemical Dictionary

Van Nostrand Reinhold Co., 135 West 50th Street, New York, NY 10020.

The Merck Index: An Encyclopedia of Chemicals and Drugs

Merck and Company, Inc., 126 E. Lincoln Ave., Rahway, NJ 07065.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man

Geneva: World Health Organization, International Agency for Research on Cancer, 1972–Present. (Multivolume work). Summaries are available in supplement volumes. 49 Sheridan Street, Albany, NY 12210.

Industrial Hygiene and Toxicology, by F.A. Patty

John Wiley & Sons, Inc., New York, NY (Multivolume work).

Clinical Toxicology of Commercial Products

Gleason, Gosselin, and Hodge.

Casarett and Doull's Toxicology; The Basic Science of Poisons

Doull, Klaassen, and Amdur, Macmillan Publishing Co., Inc., New York, NY.

Industrial Toxicology, by Alice Hamilton and Harriet L. Hardy

Publishing Sciences Group, Inc., Acton, MA.

Toxicology of the Eye, by W. Morton Grant

Charles C. Thomas, 301–327 East Lawrence Avenue, Springfield, IL.

Recognition of Health Hazards in Industry

William A. Burgess, John Wiley and Sons, 605 Third Avenue, New York, NY 10158.

Chemical Hazards of the Workplace

Nick H. Proctor and James P. Hughes, J.P. Lipincott Company, 6 Winchester Terrace, New York, NY 10022.

Handbook of Chemistry and Physics

Chemical Rubber Company, 18901 Cranwood Parkway, Cleveland, OH 44128.

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices with Intended Changes

American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Avenue, Bldg. D–5, Cincinnati, OH 45211.

Information on the physical hazards of chemicals may be found in publications of the National Fire Protection Association, Boston, MA.

Note: The following documents may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Occupational Health Guidelines

NIOSH/OSHA (NIOSH Pub. No. 81–123).

NIOSH Pocket Guide to Chemical Hazards

NIOSH Pub. No. 90–117.

Registry of Toxic Effects of Chemical Substances

(Latest edition)

Miscellaneous Documents published by the National Institute for Occupational Safety and Health:
Criteria documents.
Special Hazard Reviews.
Occupational Hazard Assessments.
Current Intelligence Bulletins.

OSHA's General Industry Standards (29 CFR Part 1910)

NTP Annual Report on Carcinogens and Summary of the Annual Report on Carcinogens.

National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; (703) 487–4650.

Bibliographic data bases service provider	File name
Bibliographic Retrieval Services (BRS), 1200 Route 7, Latham, NY 12110.	Biosis Previews
	CA Search
	Medlars
	NTIS
	Hazardline
	American Chemical Society Journal
	Excerpta Medica
	IRCS Medical Science Journal
	Pre-Med
	Intl Pharmaceutical Abstracts
	Paper Chem
Lockheed-DIALOG Information Service, Inc., 3460 Hillview Avenue, Palo Alto, CA 94304.	Biosis Prev. Files
	CA Search Files
	CAB Abstracts
	Chemical Exposure
	Chemname
	Chemsis Files
	Chemzero
	Embase Files
	Environmental Bibliographies
	Enviroline
	Federal Research in Progress
	IRL Life Science Collection
	NTIS
	Occupational Safety and Health (NIOSH)
	Paper Chem
SDC-ORBIT, SDC Information Service, 2500 Colorado Avenue, Santa Monica, CA 90406.	CAS Files
	Chemdex, 2, 3
	NTIS
National Library of Medicine	Hazardous Substances Data Bank (NSDB)
Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD 20209.	Medline Files
	Toxline Files
	Cancerlit
	RTECS
	Chemline
Pergamon International Information Corp., 1340 Old Chain Bridge Rd., McLean, VA 22101.	Laboratory Hazard Bulletin
Questel, Inc., 1625 Eye Street, NW, Suite 818, Washington, DC 20006	CIS/ILO
	Cancernet
Chemical Information System ICI (ICIS), Bureau of National Affairs, 1133 15th Street, NW, Suite 300, Washington, DC 20005.	Structure and Nomenclature Search System (SANSS)
	Acute Toxicity (RTECS)
	Clinical Toxicology of Commercial Products
	Oil and Hazardous Materials Technical Assistance Data System
	CCRIS
	CESARS
Occupational Health Services, 400 Plaza Drive, Secaucus, NJ 07094	MSDS
	Hazardline

Appendix D to § _____—Definition of ''Trade Secret'' (Mandatory)

The following is a reprint of the *Restatement of Torts* section 757, comment *b* (1939):

b. Definition of trade secret. A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers. It differs from other secret information in a business (see s759 of the *Restatement of Torts* which is not included in this Appendix) in that it is not simply information as to single or ephemeral events in the conduct of the business, as, for example, the amount or other terms of a secret bid for a contract or the salary of certain employees, or the security investments made or contemplated, or the date fixed for the announcement of a new policy or for bringing out a new model or the like. A trade secret is a process or device for continuous use in the operations of the business. Generally it relates to the production of goods, as, for example, a machine or formula for the production of an article. It may, however, relate to the sale of goods or to other operations in the business, such as a code for determining discounts, rebates or other concessions in a price list or catalogue, or a list of specialized customers, or a method of bookkeeping or other office management.

Secrecy. The subject matter of a trade secret must be secret. Matters of public knowledge or of general knowledge in an industry cannot be appropriated by one as his secret. Matters which are completely disclosed by the goods which one markets cannot be his secret. Substantially, a trade secret is known only in the particular business in which it is used. It is not requisite that only the proprietor of the business know it. He may, without losing his protection, communicate it to employees involved in its use. He may likewise communicate it to others pledged to secrecy.

Others may also know of it independently, as, for example, when they have discovered the process or formula by independent invention and are keeping it secret. Nevertheless, a substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring the information. An exact definition of a trade secret is not possible. Some factors to be considered in determining whether given information is one's trade secret are: (1) The extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and his competitors; (5) the amount of effort or money expended by him in developing the information; (6) the ease or difficulty with which the information could be properly acquired or duplicated by others.

Novelty and prior art. A trade secret may be a device or process which is patentable; but it need not be that. It may be a device or process which is clearly anticipated in the prior art or one which is merely a mechanical improvement that a good mechanic can make. Novelty and invention are not requisite for a trade secret as they are for patentability. These requirements are essential to patentability because a patent protects against unlicensed use of the patented device or process even by one who discovers it properly through independent research. The patent monopoly is a reward to the inventor. But such is not the case with a trade secret. Its protection is not based on a policy of rewarding or otherwise encouraging the development of secret processes or devices. The protection is merely against breach of faith and reprehensible means of learning another's secret. For this limited protection it is not appropriate to require also the kind of novelty and invention which is a requisite of patentability. The nature of the secret is, however, an important factor in determining the kind of relief that is appropriate against one who is subject to liability under the rule stated in this Section. Thus, if the secret consists of a device or process which is a novel invention, one who acquires the secret wrongfully is ordinarily enjoined from further use of it and is required to account for the profits derived from his past use. If, on the other hand, the secret consists of mechanical improvements that a good mechanic can make without resort to the secret, the wrongdoer's liability may be limited to damages, and an injunction against future use of the improvements made with the aid of the secret may be inappropriate.

Appendix E to § _____(Advisory)—Guidelines for Employer Compliance

The Hazard Communication Standard (HCS) is based on a simple concept—that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. The HCS is designed to provide employees with the information they need.

Knowledge acquired under the HCS will help employers provide safer workplaces for their employees. When employers have information about the chemicals being used, they can take steps to reduce exposures, substitute less hazardous materials, and establish proper work practices. These efforts will help prevent the occurrence of work-related illnesses and injuries caused by chemicals.

The HCS addresses the issues of evaluating and communicating hazards to workers. Evaluation of chemical hazards involves a number of technical concepts, and is a process that requires the professional judgment of experienced experts. That's why the HCS is designed so that employers who simply use chemicals, rather than produce or import them, are not required to evaluate the hazards of those chemicals. Hazard determination is the responsibility of the producers and importers of the materials. Producers and importers of chemicals are then required to provide the hazard information to employers that purchase their products.

Employers that don't produce or import chemicals need only focus on those parts of the rule that deal with establishing a workplace program and communicating information to their workers. This appendix is a general guide for such employers to help them determine what's required under the rule. It does not supplant or substitute for the regulatory provisions, but rather provides a simplified outline of the steps an average employer would follow to meet those requirements.

1. Becoming Familiar With The Rule.

OSHA has provided a simple summary of the HCS in a pamphlet entitled ''Chemical Hazard Communication,'' OSHA Publication Number 3084. Some employers prefer to begin to become familiar with the rule's requirements by reading this pamphlet. A copy may be obtained from your local OSHA Area Office, or by contacting the OSHA Publications Office at (202) 523–9667.

The standard is long, and some parts of it are technical, but the basic concepts are simple. In fact, the requirements reflect what many employers have been doing for years. You may find that you are already largely in compliance with many of the provisions, and will simply have to modify your existing programs somewhat. If you are operating in an OSHA-approved State Plan State, you must comply with the State's requirements, which may be different than those of the Federal rule. Many of the State Plan States had hazard communication or ''right-to-know'' laws prior to promulgation of the Federal rule. Employers in State Plan States should contact their State OSHA offices for more information regarding applicable requirements.

The HCS requires information to be prepared and transmitted regarding all hazardous chemicals. The HCS covers both physical hazards (such as flammability), and health hazards (such as irritation, lung damage, and cancer). Most chemicals used in the workplace have some hazard potential, and thus will be covered by the rule.

One difference between this rule and many others adopted by OSHA is that this one is performance-oriented. That means that you have the flexibility to adapt the rule to the needs of your workplace, rather than having to follow specific, rigid requirements. It also means that you have to exercise more judgment to implement an appropriate and effective program.

The standard's design is simple. Chemical manufacturers and importers must evaluate the hazards of the chemicals they produce or import. Using that information, they must then prepare labels for containers, and more detailed technical bulletins called material safety data sheets (MSDS).

Chemical manufacturers, importers, and distributors of hazardous chemicals are all required to provide the appropriate labels and material safety data sheets to the employers to which they ship the chemicals. The information is to be provided automatically. Every container of hazardous chemicals you receive must be labeled, tagged, or marked with the required information. Your suppliers must also send you a properly completed material safety data sheet (MSDS) at the time of the first shipment of the chemical, and with the next shipment after the MSDS is updated with new and significant information about the hazards.

You can rely on the information received from your suppliers. You have no independent duty to analyze the chemical or evaluate the hazards of it.

Employers that ''use'' hazardous chemicals must have a program to ensure the information is provided to exposed employees. ''Use'' means to package, handle, react, or transfer. This is an intentionally broad scope, and includes any situation where a chemical is present in such a way that employees may be exposed under normal conditions of use or in a foreseeable emergency.

The requirements of the rule that deal specifically with the hazard communication program are found in this section in paragraphs (e), written hazard communication program; (f), labels and other forms of warning; (g), material safety data sheets; and (h), employee information and training. The requirements of these paragraphs should be the focus of your attention. Concentrate on becoming familiar with them, using paragraphs (b), scope and application, and (c), definitions, as references when needed to help explain the provisions.

There are two types of work operations where the coverage of the rule is limited. These are laboratories and operations where chemicals are only handled in sealed containers (*e.g.*, a warehouse). The limited provisions for these workplaces can be found in paragraph (b) of this section, scope and application. Basically, employers having these types of work operations need only keep labels on containers as they are received; maintain material safety data sheets that are received, and give employees access to them; and provide information and training for employees. Employers do not have to have written hazard communication programs and lists of chemicals for these types of operations.

The limited coverage of laboratories and sealed container operations addresses the

obligation of an employer to the workers in the operations involved, and does not affect the employer's duties as a distributor of chemicals. For example, a distributor may have warehouse operations where employees would be protected under the limited sealed container provisions. In this situation, requirements for obtaining and maintaining MSDSs are limited to providing access to those received with containers while the substance is in the workplace, and requesting MSDSs when employees request access for those not received with the containers. However, as a distributor of hazardous chemicals, that employer will still have responsibilities for providing MSDSs to downstream customers at the time of the first shipment and when the MSDS is updated. Therefore, although they may not be required for the employees in the work operation, the distributor may, nevertheless, have to have MSDSs to satisfy other requirements of the rule.

2. Identify Responsible Staff

Hazard communication is going to be a continuing program in your facility. Compliance with the HCS is not a ''one shot deal.'' In order to have a successful program, it will be necessary to assign responsibility for both the initial and ongoing activities that have to be undertaken to comply with the rule. In some cases, these activities may already be part of current job assignments. For example, site supervisors are frequently responsible for on-the-job training sessions. Early identification of the responsible employees, and involvement of them in the development of your plan of action, will result in a more effective program design. Evaluation of the effectiveness of your program will also be enhanced by involvement of affected employees.

For any safety and health program, success depends on commitment at every level of the organization. This is particularly true for hazard communication, where success requires a change in behavior. This will only occur if employers understand the program, and are committed to its success, and if employees are motivated by the people presenting the information to them.

3. Identify Hazardous Chemicals in the Workplace.

The standard requires a list of hazardous chemicals in the workplace as part of the written hazard communication program. The list will eventually serve as an inventory of everything for which an MSDS must be maintained. At this point, however, preparing the list will help you complete the rest of the program since it will give you some idea of the scope of the program required for compliance in your facility.

The best way to prepare a comprehensive list is to survey the workplace. Purchasing records may also help, and certainly employers should establish procedures to ensure that in the future purchasing procedures result in MSDSs being received before a material is used in the workplace.

The broadest possible perspective should be taken when doing the survey. Sometimes people think of ''chemicals'' as being only liquids in containers. The HCS covers chemicals in all physical forms—liquids, solids, gases, vapors, fumes, and mists—whether they are ''contained'' or not. The hazardous nature of the chemical and the potential for exposure are the factors which determine whether a chemical is covered. If it's not hazardous, it's not covered. If there is no potential for exposure (e.g., the chemical is inextricably bound and cannot be released), the rule does not cover the chemical.

Look around. Identify chemicals in containers, including pipes, but also think about chemicals generated in the work operations. For example, welding fumes, dusts, and exhaust fumes are all sources of chemical exposures. Read labels provided by suppliers for hazard information. Make a list of all chemicals in the workplace that are potentially hazardous. For your own information and planning, you may also want to note on the list the location(s) of the products within the workplace, and an indication of the hazards as found on the label. This will help you as you prepare the rest of your program.

Paragraph (b) of this section, scope and application, includes exemptions for various chemicals or workplace situations. After compiling the complete list of chemicals, you should review paragraph (b) of this section to determine if any of the items can be eliminated from the list because they are exempted materials. For example, food, drugs, and cosmetics brought into the workplace for employee consumption are exempt. So rubbing alcohol in the first aid kit would not be covered.

Once you have compiled as complete a list as possible of the potentially hazardous chemicals in the workplace, the next step is to determine if you have received material safety data sheets for all of them. Check your files against the inventory you have just compiled. If any are missing, contact your supplier and request one. It is a good idea to document these requests, either by copy of a letter or a note regarding telephone conversations. If you have MSDSs for chemicals that are not on your list, figure out why. Maybe you don't use the chemical anymore. Or maybe you missed it in your survey. Some suppliers do provide MSDSs for products that are not hazardous. These do not have to be maintained by you.

You should not allow employees to use any chemicals for which you have not received an MSDS. The MSDS provides information you need to ensure proper protective measures are implemented prior to exposure.

4. Preparing and Implementing a Hazard Communication Program

All workplaces where employees are exposed to hazardous chemicals must have a written plan which describes how the standard will be implemented in that facility. Preparation of a plan is not just a paper exercise—all of the elements must be implemented in the workplace in order to be in compliance with the rule. See paragraph (e) of this section for the specific requirements regarding written hazard communication programs. The only work operations which do not have to comply with the written plan requirements are laboratories and work operations where employees only handle chemicals in sealed containers. See paragraph (b) of this section, scope and application, for the specific requirements for these two types of workplaces.

The plan does not have to be lengthy or complicated. It is intended to be a blueprint for implementation of your program—an assurance that all aspects of the requirements have been addressed.

Many trade associations and other professional groups have provided sample programs and other assistance materials to affected employers. These have been very helpful to many employers since they tend to be tailored to the particular industry involved. You may wish to investigate whether your industry trade groups have developed such materials.

Although such general guidance may be helpful, you must remember that the written program has to reflect what you are doing in your workplace. Therefore, if you use a generic program it must be adapted to address the facility it covers. For example, the written plan must list the chemicals present at the site, indicate who is to be responsible for the various aspects of the program in your facility, and indicate where written materials will be made available to employees.

If OSHA inspects your workplace for compliance with the HCS, the OSHA compliance officer will ask to see your written plan at the outset of the inspection. In general, the following items will be considered in evaluating your program.

The written program must describe how the requirements for labels and other forms of warning, material safety data sheets, and employee information and training, are going to be met in your facility. The following discussion provides the type of information compliance officers will be looking for to decide whether these elements of the hazard communication program have been properly addressed:

A. Labels and Other Forms of Warning

In-plant containers of hazardous chemicals must be labeled, tagged, or marked with the identity of the material and appropriate hazard warnings. Chemical manufacturers, importers, and distributors are required to ensure that every container of hazardous chemicals they ship is appropriately labeled with such information and with the name and address of the producer or other responsible party. Employers purchasing chemicals can rely on the labels provided by their suppliers. If the material is subsequently transferred by the employer from a labeled container to another container, the employer will have to label that container unless it is subject to the portable container exemption. See paragraph (f) of this section for specific labeling requirements.

The primary information to be obtained from an OSHA-required label is an identity for the material, and appropriate hazard warnings. The identity is any term which appears on the label, the MSDS, and the list of chemicals, and thus links these three sources of information. The identity used by

the supplier may be a common or trade name (''Black Magic Formula''), or a chemical name (1,1,1,-trichloroethane). The hazard warning is a brief statement of the hazardous effects of the chemical (''flammable,'' ''causes lung damage''). Labels frequently contain other information, such as precautionary measures (''do not use near open flame''), but this information is provided voluntarily and is not required by the rule. Labels must be legible, and prominently displayed. There are no specific requirements for size or color, or any specified text.

With these requirements in mind, the compliance officer will be looking for the following types of information to ensure that labeling will be properly implemented in your facility:

1. Designation of person(s) responsible for ensuring labeling of in-plant containers;

2. Designation of person(s) responsible for ensuring labeling of any shipped containers;

3. Description of labeling system(s) used;

4. Description of written alternatives to labeling of in-plant containers (if used); and,

5. Procedures to review and update label information when necessary.

Employers that are purchasing and using hazardous chemicals—rather than producing or distributing them—will primarily be concerned with ensuring that every purchased container is labeled. If materials are transferred into other containers, the employer must ensure that these are labeled as well, unless they fall under the portable container exemption (paragraph (f)(7) of this section). In terms of labeling systems, you can simply choose to use the labels provided by your suppliers on the containers. These will generally be verbal text labels, and do not usually include numerical rating systems or symbols that require special training. The most important thing to remember is that this is a continuing duty—all in-plant containers of hazardous chemicals must always be labeled. Therefore, it is important to designate someone to be responsible for ensuring that the labels are maintained as required on the containers in your facility, and that newly purchased materials are checked for labels prior to use.

B. Material Safety Data Sheets

Chemical manufacturers and importers are required to obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Distributors are responsible for ensuring that their customers are provided a copy of these MSDSs. Employers must have an MSDS for each hazardous chemical which they use. Employers may rely on the information received from their suppliers. The specific requirements for material safety data sheets are in paragraph (g) of this section.

There is no specified format for the MSDS under the rule, although there are specific information requirements. OSHA has developed a non-mandatory format, OSHA Form 174, which may be used by chemical manufacturers and importers to comply with the rule. The MSDS must be in English. You are entitled to receive from your supplier a data sheet which includes all of the information required under the rule. If you do not receive one automatically, you should request one. If you receive one that is obviously inadequate, with, for example, blank spaces that are not completed, you should request an appropriately completed one. If your request for a data sheet or for a corrected data sheet does not produce the information needed, you should contact your local OSHA Area Office for assistance in obtaining the MSDS.

The role of MSDSs under the rule is to provide detailed information on each hazardous chemical, including its potential hazardous effects, its physical and chemical characteristics, and recommendations for appropriate protective measures. This information should be useful to you as the employer responsible for designing protective programs, as well as to the workers. If you are not familiar with material safety data sheets and with chemical terminology, you may need to learn to use them yourself. A glossary of MSDS terms may be helpful in this regard. Generally speaking, most employers using hazardous chemicals will primarily be concerned with MSDS information regarding hazardous effects and recommended protective measures. Focus on the sections of the MSDS that are applicable to your situation.

MSDSs must be readily accessible to employees when they are in their work areas during their workshifts. This may be accomplished in many different ways. You must decide what is appropriate for your particular workplace. Some employers keep the MSDSs in a binder in a central location (*e.g.,* in the pick-up truck on a construction site). Others, particularly in workplaces with large numbers of chemicals, computerize the information and provide access through terminals. As long as employees can get the information when they need it, any approach may be used. The employees must have access to the MSDSs themselves—simply having a system where the information can be read to them over the phone is only permitted under the mobile worksite provision, paragraph (g)(9) of this section, when employees must travel between workplaces during the shift. In this situation, they have access to the MSDSs prior to leaving the primary worksite, and when they return, so the telephone system is simply an emergency arrangement.

In order to ensure that you have a current MSDS for each chemical in the plant as required, and that employee access is provided, the compliance officers will be looking for the following types of information in your written program:

1. Designation of person(s) responsible for obtaining and maintaining the MSDSs;

2. How such sheets are to be maintained in the workplace (*e.g.,* in notebooks in the work area(s) or in a computer with terminal access), and how employees can obtain access to them when they are in their work area during the work shift;

3. Procedures to follow when the MSDS is not received at the time of the first shipment;

4. For producers, procedures to update the MSDS when new and significant health information is found; and,

5. Description of alternatives to actual data sheets in the workplace, if used.

For employers using hazardous chemicals, the most important aspect of the written program in terms of MSDSs is to ensure that someone is responsible for obtaining and maintaining the MSDSs for every hazardous chemical in the workplace. The list of hazardous chemicals required to be maintained as part of the written program will serve as an inventory. As new chemicals are purchased, the list should be updated. Many companies have found it convenient to include on their purchase orders the name and address of the person designated in their company to receive MSDSs.

C. Employee Information and Training

Each employee who may be ''exposed'' to hazardous chemicals when working must be provided information and trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. ''Exposure'' or ''exposed'' under the rule means that ''an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.) and includes potential (*e.g.,* accidental or possible) exposure.'' See paragraph (h) of this section for specific requirements. Information and training may be done either by individual chemical, or by categories of hazards (such as flammability or carcinogenicity). If there are only a few chemicals in the workplace, then you may want to discuss each one individually. Where there are large numbers of chemicals, or the chemicals change frequently, you will probably want to train generally based on the hazard categories (*e.g.,* flammable liquids, corrosive materials, carcinogens). Employees will have access to the substance-specific information on the labels and MSDSs.

Information and training is a critical part of the hazard communication program. Information regarding hazards and protective measures are provided to workers through written labels and material safety data sheets. However, through effective information and training, workers will learn to read and understand such information, determine how it can be obtained and used in their own workplaces, and understand the risks of exposure to the chemicals in their workplaces as well as the ways to protect themselves. A properly conducted training program will ensure comprehension and understanding. It is not sufficient to either just read material to the workers, or simply hand them material to read. You want to create a climate where workers feel free to ask questions. This will help you to ensure that the information is understood. You must always remember that the underlying purpose of the HCS is to reduce the incidence of chemical source illnesses and injuries. This will be accomplished by modifying behavior through the provision of hazard information and information about protective measures. If your program works, you and your workers will better understand the chemical hazards within the workplace. The procedures you establish regarding, for example, purchasing, storage, and handling of these chemicals will improve, and thereby reduce the risks posed to employees exposed to the chemical hazards involved. Furthermore, your workers' comprehension will also be increased, and proper work practices will be followed in your workplace.

If you are going to do the training yourself, you will have to understand the material and be prepared to motivate the workers to learn. This is not always an easy task, but the benefits are worth the effort. More information regarding appropriate training can be found in OSHA Publication No. 2254 which contains voluntary training guidelines prepared by OSHA's Training Institute. A copy of this document is available from OSHA's Publications Office at (202) 219–4667.

In reviewing your written program with regard to information and training, the following items need to be considered:

1. Designation of person(s) responsible for conducting training;

2. Format of the program to be used (audiovisuals, classroom instruction, etc.);

3. Elements of the training program (should be consistent with the elements in paragraph (h) of this section); and,

4. Procedure to train new employees at the time of their initial assignment to work with a hazardous chemical, and to train employees when a new hazard is introduced into the workplace.

The written program should provide enough details about the employer's plans in this area to assess whether or not a good faith effort is being made to train employees. OSHA does not expect that every worker will be able to recite all of the information about each chemical in the workplace. In general, the most important aspects of training under the HCS are to ensure that employees are aware that they are exposed to hazardous chemicals, that they know how to read and use labels and material safety data sheets, and that, as a consequence of learning this information, they are following the appropriate protective measures established by the employer. OSHA compliance officers will be talking to employees to determine if they have received training, if they know they are exposed to hazardous chemicals, and if they know where to obtain substance-specific information on labels and MSDSs.

The rule does not require employers to maintain records of employee training, but many employers choose to do so. This may help you monitor your own program to ensure that all employees are appropriately trained. If you already have a training program, you may simply have to supplement it with whatever additional information is required under the HCS. For example, construction employers that are already in compliance with the construction training standard (29 CFR 1926.21) will have little extra training to do.

An employer can provide employees information and training through whatever means are found appropriate and protective. Although there would always have to be some training on-site (such as informing employees of the location and availability of the written program and MSDSs), employee training may be satisfied in part by general training about the requirements of the HCS and about chemical hazards on the job which is provided by, for example, trade associations, unions, colleges, and professional schools. In addition, previous training, education and experience of a worker may relieve the employer of some of the burdens of informing and training that worker. Regardless of the method relied upon, however, the employer is always ultimately responsible for ensuring that employees are adequately trained. If the compliance officer finds that the training is deficient, the employer will be cited for the deficiency regardless of who actually provided the training on behalf of the employer.

D. Other Requirements

In addition to these specific items, compliance officers will also be asking the following questions in assessing the adequacy of the program:

Does a list of the hazardous chemicals exist in each work area or at a central location?

Are methods the employer will use to inform employees of the hazards of non-routine tasks outlined?

Are employees informed of the hazards associated with chemicals contained in unlabeled pipes in their work areas?

On multi-employer worksites, has the employer provided other employers with information about labeling systems and precautionary measures where the other employers have employees exposed to the initial employer's chemicals?

Is the written program made available to employees and their designated representatives?

If your program adequately addresses the means of communicating information to employees in your workplace, and provides answers to the basic questions outlined above, it will be found to be in compliance with the rule.

5. Checklist for Compliance

The following checklist will help to ensure you are in compliance with the rule:

Obtained a copy of the rule. _____
Read and understood the requirements. _____
Assigned responsibility for tasks. _____
Prepared an inventory of chemicals. _____
Ensured containers are labeled. _____
Obtained MSDS for each chemical. _____
Prepared written program. _____
Made MSDSs available to workers. _____
Conducted training of workers. _____
Established procedures to maintain current program. _____
Established procedures to evaluate effectiveness. _____

6. Further Assistance

If you have a question regarding compliance with the HCS, you should contact your local OSHA Area Office for assistance. In addition, each OSHA Regional Office has a Hazard Communication Coordinator who can answer your questions. Free consultation services are also available to assist employers, and information regarding these services can be obtained through the Area and Regional offices as well.

The telephone number for the OSHA office closest to you should be listed in your local telephone directory. If you are not able to obtain this information, you may contact OSHA's Office of Information and Consumer Affairs at (202) 219–8151 for further assistance in identifying the appropriate contacts.

8. In § 1928.21, paragraph (a)(5) is republished for the convenience of the user to read as follows:

§ 1928.21 Applicable standards in 29 CFR Part 1910.

(a) * * *

(5) Hazard communication—§ 1910.1200.

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