

List of Regulated Substances and Thresholds for Accidental Release Prevention; Requirements for Petitions under Section 112(r) of the Clean Air Act as Amended

ENVIRONMENTAL PROTECTION AGENCY

40 CFR PARTS 9 AND 68

[FRL-4828-6]

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is promulgating the list of regulated substances and thresholds required under section 112(r) of the Clean Air Act as amended. The list is composed of three categories: a list of 77 toxic substances, a list of 63 flammable substances, and explosive substances with a mass explosion hazard as listed by the United States Department of Transportation (DOT). Threshold quantities are established for toxic substances ranging from 500 to 20,000 pounds. For all listed flammable substances the threshold quantity is established at 10,000 pounds. For explosive substances the threshold quantity is established at 5,000 pounds. The list and threshold quantities will identify facilities subject to chemical accident prevention regulations promulgated under section 112(r) of the Clean Air Act as amended; a proposed regulation for such requirements has been published in the Federal Register on October 20, 1993, entitled *Risk Management Programs for Chemical Accidental Release Prevention*. EPA is also promulgating in this regulation the requirements for the petition process for additions to, or deletions from, the list of regulated substances. EPA is deferring action on a proposed exemption from regulation for listed flammable substances when used solely for facility consumption as fuel. For a document relating to the proposed exemption, see a supplemental notice published elsewhere in this issue.

DOCKET: Supporting information used in developing both the proposed and the final rule is contained in Docket No. A-91-74. The docket is available for public inspection and copying from 8:00 a.m. to 4:00 p.m., Monday through Friday, at the EPA's Air Docket Section, Waterside Mall, Room M 1500, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington D.C. 20460. A reasonable fee may be charged for copying.

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7913, Chemical Emergency Preparedness and Prevention Office, Mailcode 5101, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington D.C. 20460, or the Emergency Planning and Community Right-to-Know Hot Line at 1-800-535-0202.

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I. Introduction

A. Statutory Authority

This final rule is being issued under sections 112(r) and 301 of the Clean Air Act (CAA or Act) as amended (42 U.S.C. 7412(r), 7601).

B. Background

Public awareness of the potential danger from accidental releases of hazardous chemicals has increased over the years as serious chemical accidents have occurred around the world (e.g., the 1974 explosion in Flixborough, England, and the 1976 release of dioxin in Seveso, Italy). Public concern intensified following the 1984 release of methyl isocyanate in Bhopal, India, which killed more than 2,000 people living near the facility. A subsequent release from a chemical facility in Institute, West Virginia, sent more than 100 people to the hospital and made Americans aware that such accidents can and do happen in the United States.

In response to this public concern and the hazards that exist, the U.S. Environmental Protection Agency (EPA) began its Chemical Emergency Preparedness Program (CEPP) in 1985, as part of the Agency's Air Toxics Strategy. CEPP was a voluntary program to encourage state and local authorities to identify hazards in their areas and to plan for chemical emergency response actions. In 1986, Congress adopted many of the elements of CEPP in the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), also known as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III). EPCRA requires states to establish state and local emergency planning groups, namely the State Emergency Response Commissions (SERCs) and the Local Emergency Planning Committees (LEPCs), to develop emergency response plans for each community. EPCRA requires facilities to provide information on the hazardous chemicals they have on-site; the information collected is available to the public through the SERC/LEPC structure. This information forms the foundation of both the emergency response plans and the public-industry dialogue on risks and risk reduction.

Congress required EPA, under EPCRA (SARA Title III) section 305(b), to conduct a review of emergency systems to monitor, detect, and prevent chemical accidents. The final report to Congress, *Review of Emergency Systems* (EPA, 1988), concluded that the prevention of accidental releases requires an integrated approach that considers technologies, operations, and management practices. The report emphasized the importance of management commitment to safety.

In 1986, EPA established a chemical accident prevention program to collect information on chemical accidents and work with other groups to increase knowledge of prevention practices and encourage industry to improve safety at facilities. Under this program, EPA developed its Accidental Release Information Program (ARIP) to collect data on the causes of chemical accidents and the steps facilities take to prevent recurrences. EPA also developed a program for conducting chemical safety audits at facilities. Through the audit program, EPA headquarters and regional staff, as well as state and local officials, learned about integrated approaches to process safety from facilities. EPA has also worked with trade associations, professional organizations, labor, environmental groups, and other Federal

agencies to determine how best to reach smaller operations, which the section 305(b) study indicated are less aware of risks than larger facilities. EPA has also been an active participant in international efforts related to chemical accident prevention, particularly through the Organisation for Economic Cooperation and Development (OECD), which has held five international workshops from 1989 through 1991 to discuss issues related to accident prevention, preparedness, and response, and has developed guidelines for member countries.

In addition to EPA's work in this area, other agencies and states have developed programs related to chemical accident prevention. The Occupational Safety and Health Administration (OSHA) promulgated a final rule on chemical process safety management amending 29 CFR 1910.109 and adding 29 CFR 1910.119 (57 FR 6356, February 24, 1992) as required under section 304 of the Clean Air Act Amendments of 1990 (CAA Amendments). Four states -- New Jersey, California, Delaware, and Nevada -- have operational risk management programs. Additional states have begun to address accidental release prevention as part of their air toxics program development.

Professional and trade organizations have also developed programs in this area. For example, the Center for Chemical Process Safety of the American Institute of Chemical Engineers has published guidance on the management of chemical process safety. The Chemical Manufacturers' Association has adopted a Responsible Care™ program, which all members must comply with to maintain membership. The American Petroleum Institute has developed a similar program, Management of Process Hazards; Recommended Practice 750 (RP 750), for its members. In 1982, the European Community adopted the Seveso Directive (82/501/EEC, as amended), which requires facilities handling certain chemicals to develop a safety report that is similar to a risk management plan.

II. Clean Air Act Amendments of 1990

A. Prevention of Accidental Releases

In the CAA Amendments, signed into law on November 15, 1990, Congress added subsection (r) to CAA section 112 for the prevention of chemical accidents. The goals of the chemical accident prevention provisions are to focus on chemicals that pose a significant hazard to the community should an accident occur, to prevent their accidental release and to minimize the consequences of such releases.

Section 112(r) of the CAA has a number of provisions. Under section 112(r) owners and operators of stationary sources who produce, process, handle, or store substances listed under section 112(r)(3) or any other extremely hazardous substances have a general duty to initiate specific activities to prevent and mitigate accidental releases. The general duty requirements apply to stationary sources regardless of the quantity of substances managed at the facility. Activities such as identifying hazards which may result from accidental releases using appropriate hazard assessment techniques; designing, maintaining and operating a safe facility; and minimizing the consequences of accidental releases if they occur would be essential activities to be taken as necessary to satisfy the general duty requirements. As a matter of business practice, owners and operators of these stationary sources have a duty to conduct these

activities under section 112(r) in the same manner and to the same extent as an employer's duties under OSHA's general duty clause in section 654 of Title 29 of the United States Code.

Section 112(r)(3) of the CAA requires EPA to promulgate an initial list of at least 100 substances ("regulated substances") that are known to cause, or may be reasonably anticipated to cause, death, injury, or serious adverse effects to human health or the environment if accidentally released. EPA is required to set threshold quantities for each listed substance. Under CAA section 112(r)(7), the Act requires EPA to promulgate reasonable regulations and appropriate guidance to provide for the prevention and detection of accidental releases and for responses to such releases. The accident prevention regulations will apply to stationary sources that have present more than a threshold quantity of a regulated substance. These regulations shall address, as appropriate, the use, operation, repair, and maintenance of equipment to monitor, detect, inspect, and control releases, including training of personnel in the use and maintenance of equipment or in the conduct of periodic inspections. The regulations shall include requirements for the development and submission of Risk Management Plans (RMPs) by regulated sources. The RMP shall include a hazard assessment, a prevention program, and an emergency response program. The proposed rule for accident prevention, *Risk Management Programs for Chemical Accidental Release Prevention*, was published on October 20, 1993 (58 FR 54190).

The Act establishes a Chemical Safety and Hazard Investigation Board to investigate (or cause to be investigated) chemical accidents at facilities and recommend to Congress, Federal, state, local authorities, and the public actions that can be taken to improve chemical safety. Under the Act, EPA is authorized to conduct studies related to accidental releases, including research on hazard assessments, hydrogen fluoride, and air dispersion modeling. A report to Congress on hydrogen fluoride was completed and published by the Agency in September 1993, entitled *Hydrogen Fluoride Study, Report to Congress, Section 112(n)(6) of the Clean Air Act as Amended*.

The Clean Air Act also addressed the approval of state programs and delegation of Federal authorities for all section 112 requirements in section 112(l). Thus, state Accidental Release Prevention programs are approved through the authorities in section 112(l). The approval provisions of section 112(l)(5) include a determination that: a state program contains the authorities to assure compliance by all sources within the state with each applicable standard, regulation, or requirement; adequate resources are available to implement the program; an expeditious implementation schedule is in place to ensure that affected sources achieve compliance; and the state program is otherwise in compliance with the objectives of the Act and guidance published under section 112(l)(2).

The Agency promulgated a final rule in November 1993 which addresses the approval requirements of section 112(l) entitled *Approval of State Programs and Delegation of Federal Authorities*. These requirements can be found in 40 CFR Part 63 - Subpart E. Section 63.95 specifically address the required components of an accidental release prevention program. The Agency is currently working on developing further guidance to states in regard to the development of an accidental release prevention program.

Under section 304 of the CAA Amendments OSHA was required to promulgate a chemical process safety management standard to protect employees from hazards associated with accidental releases of highly hazardous chemicals in the workplace. OSHA promulgated a final rule amending 29 CFR 1910.109 and adding 29 CFR 1910.119 (57 FR 6356, February 24, 1992) that requires a chemical process safety management (PSM) program for any process involving a highly hazardous chemical at or above a specified threshold quantity. The rule applies to a list of highly hazardous toxic and reactive substances at particular threshold quantities, flammable liquids or flammable gases in quantities of 10,000 pounds or more and to the manufacture of explosives and pyrotechnics.

B. List of Substances and Thresholds; Petitions for Additions and Deletions

1. Legislative Requirements

The Act requires EPA to promulgate an initial list of at least 100 substances that, in the event of an accidental release, are known to cause or may reasonably be anticipated to cause death, injury, or serious adverse effects to human health or the environment. An accidental release is defined under CAA section 112(r)(2)(A) as "an unanticipated emission...into the ambient air from a stationary source." In developing this list, EPA was required to consider, but was not limited to, the list of extremely hazardous substances (EHSs) promulgated under EPCRA (SARA Title III) section 302.

Congress listed the following 16 substances to be included in the initial list (the Chemical Abstracts Service (CAS) Registry number is provided in parentheses):

chlorine (7782-50-5),

ammonia and anhydrous ammonia (7664-41-7),

methyl chloride (74-87-3),

ethylene oxide (75-21-8),

vinyl chloride (75-01-4),

methyl isocyanate (624-83-9),

hydrogen cyanide (74-90-8),

hydrogen sulfide (7783-06-4),

toluene diisocyanate, represented by:

-toluene 2,4-diisocyanate (584-84-9)
-toluene 2,6-diisocyanate (91-08-7)
-toluene diisocyanate, unspecified isomer (26471-62-5)
phosgene (75-44-5),
bromine (7726-95-6),
anhydrous hydrogen chloride (7647-01-0),
hydrogen fluoride (7664-39-3),
anhydrous sulfur dioxide (7446-09-5), and
sulfur trioxide (7446-11-9).

No air pollutant for which a national primary ambient air quality standard has been established may be included on the list, with the exception of anhydrous sulfur dioxide and sulfur trioxide, which must be included. No substances regulated under Title VI of the Act as amended may be included on the list. Title VI covers ozone depleters, primarily chlorofluorocarbons (CFCs) and halons. The Act requires EPA to review, and if necessary revise, the list of regulated substances under section 112(r) at least every five years. EPA may also review and if necessary revise the list as a result of petitions. EPA is required to develop procedures for petitions to the Agency for the addition of substances to, and deletion of substances from, the list; these petition procedures are to be consistent with those applicable to the list of hazardous air pollutants found in CAA Amendments section 112(b).

2. Summary of Proposed Rule

On January 19, 1993 (58 FR 5102), EPA proposed a list of 100 toxic substances and threshold quantities, a list of 62 flammable substances (gases and volatile liquids) with threshold quantities of 10,000 pounds, and commercial explosives defined by the Department of Transportation (DOT) as Division 1.1 (explosives with mass explosion hazard) with a threshold quantity of 5,000 pounds. EPA also proposed requirements for a petition process to add or delete chemicals from the list.

Toxic substances were included on the list based on their toxicity, physical state, vapor pressure, production volume, and accident history. Toxicity criteria used to identify chemicals as extremely hazardous substances (EHSs) under EPCRA were used as criteria for the proposed list. The acute toxicity criteria are: (a) Inhalation LC50 0.5 milligrams per liter of air (for exposure time 8 hours), or

(b) Dermal LD50 50 milligrams per kilogram of body weight, or

(c) Oral LD50 25 milligrams per kilogram of body weight

where LC50 is the median concentration in air at which 50 percent of the test animals died, and LD50 is the median lethal dose that killed 50 percent of the test animals. In the absence of LC50 or LD50 data, LCLo or LDLo data were used for listing, where LCLo is the lethal concentration low, or lowest concentration in air at which any of the test animals died, and LDLo is the lethal dose low, or the lowest concentration at which any of the test animals died. Additional substances on the EHS list meet the secondary EHS toxicity criteria in light of production volume (see Appendix B of EPA's Technical Guidance for Hazards Analysis, December 1987, which is in the docket for this rulemaking). A vapor pressure criterion of 0.5 millimeters of mercury (mm Hg) was used as a baseline, based on the vapor pressure of toluene diisocyanate, a substance mandated for the initial list by Congress; toxic gases and liquids with a vapor pressure of 0.5 mm Hg or higher under ambient conditions were considered for listing. Only toxic chemicals in commercial production, verified through EPA's Toxic Substances Control Act (TSCA) Chemical Inventory, were included on the list. By applying these criteria to the 360 chemicals on the EPCRA EHS list, the Agency identified 87 potential regulated substances for the CAA Amendments section 112(r) list. The Agency also looked at other data sources (including the OSHA highly hazardous chemical list) to identify 9 more substances for the section 112(r) list. Four additional substances were identified for listing based on a combination of toxicity, high production volume, and history of accidents involving death or injury. Threshold quantities were set for toxic substances based on a ranking method that considers toxicity and volatility of the chemicals. EPA assigned identical thresholds to chemicals with similar ranking scores, ranging from 500 pounds to 10,000 pounds.

Flammable gases and volatile flammable liquids were included on the list based on the flash point and boiling point criteria used by the National Fire Protection Association (NFPA) for its highest flammability hazard ranking (flash point below 73°F (22.8°C) and boiling point below 100°F (37.8°C)) (*Fire Protection Guide on Hazardous Materials*, 1984, 8th edition). Only flammable substances in commercial production were listed. The threshold quantity for flammable substances was set at 10,000 pounds, based on the potential for a vapor cloud explosion.

Explosives in Division 1.1 were proposed for listing based on their potential to detonate. The threshold quantity for explosives was set at 5,000 pounds because a detonation of this quantity could yield blast wave overpressures of 3.0 pounds per square inch (psi) at a distance of 100 meters from the blast site and could have potentially lethal effects in the community beyond the fence line.

EPA proposed to apply the threshold quantity to the maximum total quantity of a substance in a process. This definition would apply to the maximum total quantity, at any one time, in a single vessel, in a group of interconnected vessels or in several vessels that could potentially be involved at one time in an accidental release. Substances in mixtures would be exempted from the threshold determination if they represent less than one percent of the mixture by weight. EPA also proposed to exempt substances if (1) they are part of articles; (2) if they are used as structural components; (3) if they are used for janitorial

maintenance; or (4) if they are found in consumer products, process water, or in water or air from the environment or municipal sources. Activities in laboratories were also proposed for exemption. In addition, an exemption was proposed for flammable substances present at a facility to be used solely for consumption as fuel at the facility.

The Agency also proposed requirements for petitions to add or delete regulated substances under section 112(r). The Agency proposed to establish that the burden of proof be on the petitioner to demonstrate that the criteria for addition and deletion are met. Basic administrative and documentation requirements for petitions were also included in the proposal.

III. Public Participation

A hearing was held on the proposed rule in the EPA Auditorium, 401 M Street, S.W., Washington D.C., on Tuesday, April 12, 1993. The hearing was held to provide interested parties the opportunity for oral presentation of data, views, or arguments concerning the proposed rule. This hearing was open to the public; a transcript of the public hearing is available in the docket. A total of 272 letters were received during the public comment period on the proposed rule (an additional 18 were received after the close of the public comment period); copies of all comment letters received are available for public inspection in the docket. A response to comments document, entitled *Proposed List of Substances and Thresholds for Accidental Release Prevention: Summary and Response to Comments*, includes a summary of comments received and the Agency's responses; the document is available in the docket.

IV. Discussion of Comments and Major Regulatory Changes

This portion of the preamble discusses comments on major issues received on the proposed list and thresholds rule and the principal regulatory changes made in the final rule in response to public comments. Included in the discussion is the rationale for these changes and the Agency action on the comments. Where the proposed regulation has not been changed in the final rule, the Agency continues to rely on the rationale provided in the proposal notice, supplemented as appropriate by additional discussion in this preamble and in the response to comments document.

A. List of Substances and Thresholds

The list of substances and thresholds promulgated today identifies sources that are subject to accident prevention regulations promulgated under section 112(r)(7) of the Act. The list of substances is intended to focus accidental release prevention efforts on those stationary sources and substances that pose the most significant risks to the community. These risks may be established either by the potential of the chemical to cause harm (the inherent hazards and physical/chemical properties), known incidents (accident history), or a combination thereof. EPA strongly emphasizes that the substances promulgated in today's listing are not the only substances that may pose a threat to communities upon release. There are large numbers of compounds and mixtures in commerce in the U.S. that in specific circumstances could be considered dangerous to human health or the environment; however, it would not be feasible to

include all such substances and circumstances. This list should serve to focus prevention efforts and is not a list of all substances that could be considered for accident prevention. Similarly, the threshold quantities established today may not always represent a level below which no hazard exists. Although stationary sources will be required to comply with the accidental release prevention regulations under section 112(r)(7)(B) only if they have listed substances in quantities exceeding the threshold quantity, it does not mean that these substances in smaller quantities represent no potential hazard to the community in certain circumstances. In support of this principle Congress included general duty provisions under section 112(r)(1) of the Act.

Several commenters objected to the listing of classes of substances such as explosives or particular substances such as various flammable natural gases because these commenters claimed that categorizing these chemicals as regulated substances would also make these chemicals subject to the general duty clause of section 112(r)(1), and that without such listing these chemicals would be outside the scope of section 112(r)(1). The general duty provision in section 112(r)(1) applies to "any substance listed pursuant to section 112(r)(3) or any other extremely hazardous substance." The Agency believes the scope of substances covered by section 112(r)(1) is not affected by this rulemaking except that by including a substance on the regulated substance list, the Agency unambiguously specifies that the general duty provisions apply to such chemicals. The plain language of section 112(r)(1) applies not only to the regulated substances listed today but also to "any other extremely hazardous substance."

In discussing nearly identical language in the Senate's Clean Air Act Amendments bill of 1989, the Environment and Public Works Committee expressed the intent that the term "extremely hazardous substance" would include not only listed substances under the accident prevention provisions and extremely hazardous substances under EPCRA (SARA Title III) section 302 but also "other agents which may or may not be listed or otherwise identified by any Government agency which may as the result of short-term exposures associated with releases to the air cause death, injury or property damage" (Senate Committee on Environment and Public Works, Clean Air Act Amendments of 1989, Senate Report No. 228, 101st Congress, 1st Session 211 (1989) - "Senate Report"). Regardless of whether a substance is listed under today's rule, the general duty to identify and assess hazards associated with accidental releases (as defined in section 112(r)(2)), to design and maintain a facility to prevent such releases, and to minimize the consequences of such releases that do occur, extends to owners and operators of any facility that may cause such impacts due to short-term exposures. As the Senate makes clear, "the release of any substance which causes death or serious injury because of its acute toxic effect or as a result of an explosion or fire or which causes substantial property damage by blast, fire, corrosion or other reaction would create a presumption that such substance is extremely hazardous." Senate Report at 211. No revision to the list promulgated today negates the applicability of the general duty provisions.

1. Toxic Substances

a. Listing Criteria

Several commenters suggested that EPA modify its listing criteria, largely so that EPA's list would be more consistent with OSHA's list of Highly Hazardous Substances for its Process Safety Management Standard, but also because commenters believed EPA's list includes some chemicals that do not pose the greatest hazards to the public. Some commenters suggested the proposed 0.5 mm Hg vapor pressure cut off was too low. Others suggested an alternative method of choosing the list of toxics, namely the "Substance Hazard Index". Several commenters also objected to EPA's use of accident history as a criterion for listing substances. EPA's proposed toxics list was based on the EHS list under SARA Title III, with additional consideration of the vapor pressures and accident histories for each substance. The proposed list included 50 toxic substances that are not listed by OSHA.

Substance Hazard Index: Some commenters suggested replacing EPA's proposed listing criteria with another method labeled the "Substance Hazard Index" (SHI). The SHI is the ratio of a substance's vapor pressure to its acute toxicity; all substances would be ranked by their SHI and a cut-off would need to be selected to determine the substances to be listed. An SHI value of 1,000 was suggested by commenters as a cut-off, but commenters did not provide a technical basis, or any other rationale, for why this cut-off was selected. The SHI value of 1,000 would derive a list of toxic substances that more closely approximates OSHA's PSM list than EPA's proposed list; provided that the Agency considers only those substances initially proposed for listing as toxics.

EPA generally disagrees with the comments concerning the use of the SHI as a listing criterion. The Agency had considered this approach during the proposed rule development, but decided not to include it as an alternate listing methodology option. EPA instead considered toxicity and vapor pressure separately in identifying chemicals for listing; the SHI combines these factors. EPA believes that using separate toxicity and vapor pressure criteria is a more valid method of identifying chemical candidates for listing. Both EPA's method and the SHI approach consider properties related to the severity of acute health effects (toxicity) and the likelihood of accidental releases of the substances (volatility), as required by the Act. However, as required by the Act, EPA's approach is based on the list of EHSs as a starting point for identification of toxic substances (see Senate Report at 218; listing factors used in EHS list are appropriate for accidental release program). EPA's approach limits toxic chemicals to those meeting the acute toxicity criteria for the EHS list and then applies a vapor pressure cut-off. The SHI approach does not include specific toxicity or vapor pressure cut-offs but instead specifies a cut-off value for a factor combining toxicity and vapor pressure. To identify all chemicals meeting the specific SHI cut-off of 1,000 as recommended by commenters, chemicals with a much wider range of toxicity than those represented by the EHSs would have to be considered. Chemicals that are far less toxic than the EHSs would be potentially included, improperly characterizing the risk associated with them. Moreover, EPA does not believe the SHI method has been systematically applied to all substances for development of any current chemical list. The state of Delaware used the SHI approach to develop a list of substances for its risk management regulation; the SHI methodology was applied to existing lists of substances identified by use of toxicity criteria and not all substances. The Agency considers the SHI to be more appropriate for determining the relative ranking of substances in an already established list. The Agency's threshold quantity methodology for listed toxics is similar on the toxicity/volatility ranking principle; it differs from the SHI in that the vapor pressure is only part of the factor used to account for the potential dispersability of the listed substances. For these reasons, the Agency will not adopt the SHI

criteria for listing toxic substances.

Acute Toxicity Criteria: Commenters generally supported EPA's consideration of acute toxicity hazards as a basis for listing toxic substances under section 112(r). Some commenters, however, recommended other measures of toxicity, such as the Emergency Response Planning Guidelines (ERPGs) developed by the American Industrial Hygiene Association, or data developed by the National Academy of Sciences among others. The Agency recognizes the value of these other measures and guidelines for purposes of emergency preparedness and prevention activities. However, these measures are consensus exposure levels judged by the developing organizations to represent concentrations above which there may be serious irreversible health effects, or death, as a result of a single exposure for a relatively short period of time. In addition, the methodology for most of these measures is still in the developmental stages, with recommended guidelines or acute exposure levels presently available only for a limited number of potentially hazardous substances. The Agency believes using acute toxicity data as proposed is more appropriate for the review and selection of hazardous substances for listing under section 112(r) because acute toxicity data directly reflects results of valid mammalian testing and thus is more objectively verifiable than judgmental standards.

Concerns were also expressed about the Agency's focus on acute toxicity rather than on chronic toxicity effects as a basis for listing. Some commenters also opposed the Agency's consideration of acute exposures by the dermal and oral routes. EPA believes that chemical accident prevention efforts should focus on those chemicals that, because of their inherent toxicity, are most likely to cause immediate severe, irreversible health effects following exposures during an accidental release. Consequently, for purposes of this rulemaking, the Agency is primarily interested in substances that are acutely toxic, rather than in substances that could generate a future health effect after repeated long term or chronic exposures. Furthermore, acute toxicity and lethality data are often readily available and the most commonly reported information generated by animal toxicity testing. A greater number of potentially hazardous substances can therefore be screened on the same basis using these values. For purposes of this rule, the listed toxic substances are expected to rapidly become airborne, thus human exposure by the inhalation route is of primary concern. The Agency believes that using data on oral and dermal acute lethality, in addition to inhalation lethality, is appropriate for this listing.

Vapor Pressure Cut-off: Other commenters suggested that EPA should use a higher vapor pressure level as a listing criterion. EPA's vapor pressure criterion of 0.5 mm Hg was based on the properties of toluene diisocyanate, a substance with relatively low volatility, which was mandated for the initial list by Congress. Commenters noted that Congress listed toluene diisocyanate because it has been involved in accidents, not because of its properties, and that its properties do not necessarily provide a valid basis for EPA's vapor pressure criterion. Several commenters suggested a vapor pressure of 20 mm Hg (18 mm Hg is the approximate vapor pressure of water) but did not provide a basis for choosing this or any other vapor pressure criterion.

EPA has considered the comments concerning the proposed vapor pressure criterion of 0.5 mm Hg and generally agrees that this low vapor pressure level may lead to an overly conservative listing of chemicals that pose a relatively lower potential for air releases. EPA has decided to set the vapor

pressure criterion at the higher level of 10 mm Hg. In selecting this new vapor pressure cut-off, the Agency examined the substances on the proposed list that have vapor pressures of less than 10 mm Hg and compared the rate of volatilization expected in a large release to the rate expected for substances with a vapor pressure greater than 10 mm Hg. As expected, volatilization rates increase with increasing vapor pressure and increasing pool sizes. The Agency believes that a timely facility response after the onset of an accidental release will likely limit the amount that could volatilize for substances with vapor pressures lower than 10 mm Hg, thereby reducing the potential public or off-site impact. The Agency believes that a greater amount of substances with vapor pressures above 10 mm Hg is likely to be volatilized and released, even after a timely facility response occurs, potentially causing off-site impacts. The Agency also reviewed accident history and production volume information on the substances that would be delisted at this vapor pressure. This review has led the Agency to conclude that the accident histories or production volumes associated with the delisted substances do not warrant their listing under this rulemaking at this time. The Agency believes that this revised vapor pressure criterion focuses the list on chemicals that present a greater potential for accidental release than would a list using a 0.5 mm Hg criterion.

The new vapor pressure criterion will drop from the list some chemicals that may have a lower likelihood of accidental release to air. Using the new vapor pressure criterion, the following 18 chemicals proposed for listing (shown with their CAS Registry numbers) will not be included in the list promulgated today:

Acetone cyanohydrin (75-86-5)

Aniline (62-53-3)

Antimony pentafluoride (7783-70-2)

Benzal chloride (98-87-3)

Benzenamine, 3-(trifluoromethyl)- (98-16-8)

Benzotrichloride (98-07-7)

Benzyl chloride (100-44-7)

Benzyl cyanide (140-29-4)

Chloroethanol (107-07-3)

Dichloroethyl ether (111-44-4)

Dimethyl phosphorochloridothioate (2524-03-0)

Formaldehyde cyanohydrin (107-16-4)

Hydrogen peroxide (concentration > 52%) (7722-84-1)

Lactonitrile (78-97-7)

Pyridine, 2-methyl-5-vinyl- (140-76-1)

Thiophenol (108-98-5)

Trans-1,4-dichlorobutene (110-57-6)

Trichloroethylsilane (115-21-9)

EPA will be reevaluating the list periodically and as a result of petitions. If additional information is submitted on the accident history or production volume of these substances, EPA may list these substances at a later time. In addition, these substances, as well as any other extremely hazardous substance, are subject to the section 112(r) general duty clause.

Accident History: The Agency disagrees with several commenters who claimed that the Agency lacked authority to list substances based on accident history. The accident history associated with the use of a substance, in combination with toxicity, physical/chemical properties, and production volume considerations, is a permissible basis for the Administrator to list substances under section 112(r). Data from recorded accidents relate to each of the factors identified in section 112(r)(4). Such data can provide information on the severity of impacts when impacts occur, as well as on the likelihood and magnitude of exposure. Substances that "are known to cause ... death, injury, or serious adverse effects on human health or the environment" may be included on the list under section 112(r)(3). It would be a strained reading of the statute to say the Administrator must ignore documented accidental releases of substances in deciding which chemicals shall be the focus of the accidental release prevention program.

The listing criteria established for toxic substances considers not only acute toxicity, but also physical/chemical properties (physical state, vapor pressure), and accident history. Several commenters argued that in analyzing accident histories EPA should not consider: (1) transportation accidents; (2) accidents not involving death and/or injuries; (3) accidents involving fires and explosions; (4) accidents involving reactions with other chemicals; and (5) accidents involving elevated temperatures and pressures. The Agency disagrees with these comments. Accident history may indicate, beyond vapor pressure or other physical/chemical properties, unique qualities or circumstances that warrant accident prevention efforts. Evidence from transportation accidents may indicate the potential for airborne releases. For example, chemicals may be supplied in containers, such as tank cars, holding the chemical in similar conditions to storage conditions at stationary source. A failure of a container while in transit may indicate the potential

for release while at a fixed location, since it may be stored under similar conditions. Quantities of chemicals are also commonly held at facilities for some period of time in trucks, tank cars, and other shipping containers. Accidents that did not result in off-site deaths or injuries may still indicate the serious potential for off-site impacts; e.g., evacuations may indicate that there was concern that people could suffer adverse effects from exposure. Furthermore, other effects, such as environmental damage, are appropriate to consider as well. While the factors to be considered under section 112(r)(4) do not specifically direct EPA to consider environmental effects, section 112(r)(3) directs the Administrator to consider "substances which pose the greatest risk of causing...serious adverse effects to...the environment from accidental releases". As noted at several points in this preamble, EPA believes that its decision to consider reported accidental releases involving fire and explosions as events of concern is supported by both the statute and legislative history. See also 136 Congressional Record S16992 (daily ed., Oct. 27, 1990) (statement of Senator Reid addressing the explosion in Henderson, Nevada); 136 Congressional Record H12931 (daily ed., Oct. 26, 1990) (statement of Representative Barton addressing releases from burning material); H.R. Conf. Rep. No. 952, 101st Congress, 2nd sess., 340 (1990) (Board to investigate fires and explosions). It may also be appropriate to consider chemical reactions with common materials such as water; e.g., it may be important to consider whether the reaction of an acid with water, producing heat, could lead to formation of an acid vapor or mist (the Bhopal accident involved a reaction of methyl isocyanate with water, generating heat). Accidents resulting from conditions of elevated temperatures and pressures in chemical processes may provide important information regarding the potential for accidental releases having an effect off-site.

The legislative history of section 112(r) contains extensive discussion of historical accidents and accident history data to support the need for enacting section 112(r) and the particular provisions included in the legislation. See 136 Congressional Record H12940 (daily ed., Oct. 26, 1990) (statement of Representative Richardson); 136 Congressional Record S16921, S16925 - 26 (daily ed., Oct. 27, 1990) (statement of Senator Durenberger); 136 Congressional Record S16979 (daily ed., Oct. 27, 1990) (statement of Senator Baucus). Incidents such as the explosion in Henderson, Nevada and the releases documented in the Acute Hazardous Events database, as well as statistics concerning the number of releases and evacuations were seen as demonstrating the need for an accident prevention program. See H. R. Rep. No. 490, 101st Congress, 2nd sess., 154 - 157 (1990); Senate Report at 211 - 221. The Agency will continue to consider accident history, in conjunction with acute toxicity and vapor pressure, to determine which substances need to be listed under section 112(r), and will consider these same elements in any revisions to the list promulgated today. When determining whether to list a substance based on its accident history, the Agency will analyze and explain the relevance of the accident history to the potential for a stationary source to accidentally release the substance.

b. Specific Substances. Sulfuric acid, phenol, parathion, and nitrobenzene, proposed to be listed because of accident history, were the focus of a number of comments. As stated above, the Agency believes that accident history, as well as toxicity, physical/chemical properties, and current commercial production volume, are all appropriate elements to be considered in determining the substances to be listed. The Agency reserves the flexibility to consider the listed substances in light of a combination of, or all of these criteria elements. Accident history was targeted by several commenters as not being a valid criteria to use in listing these substances. As discussed above, the Agency disagrees. The Agency has listed

substances that meet two or three elements of the criteria only; e.g., there are acutely toxic substances listed that meet the high vapor pressure considerations but have no accident history associated with them. By the same token, the Agency also believes that commercially produced substances that meet the acute toxicity criterion and have an accident history, still could present a high potential for an impact beyond the fence line even though they do not meet the vapor pressure consideration.

A number of commenters objected to the inclusion of sulfuric acid on the list of substances, noting that because of its high boiling point and low vapor pressure under ambient conditions, it is unlikely to become airborne in a release. EPA recognizes that sulfuric acid does not meet the vapor pressure criterion. EPA originally proposed for listing sulfuric acid because of its toxicity, high production volume, and because it has been involved in a number of accidental releases with reported migration of a vapor cloud off-site; some of these incidents also resulted in worker deaths and injuries on-site. Several commenters indicated that the accidents cited by EPA did not provide a valid basis for listing for a number of reasons. First, some of the accidents, according to commenters, actually involved fuming sulfuric acid (oleum), which is a mixture of sulfuric acid and sulfur trioxide, and vapor clouds reported from these accidents were attributable to sulfur trioxide rather than sulfuric acid. Second, commenters stated that the injuries in some accidents were caused by direct contact with sulfuric acid rather than inhalation of vapor. Third, according to some commenters, some accidents involved reactions of sulfuric acid with other substances. Finally, comments were received which indicated there have been no accidents involving vapor clouds of sulfuric acid that caused off-site deaths or injuries, and that, in fact, the low vapor pressure of sulfuric acid makes it impossible for an accidental release to have any effect beyond the fence line.

EPA is well aware that sulfuric acid has a low vapor pressure and is unlikely to be released into the air under ambient conditions. However, as noted above, EPA also believes that, exclusive of vapor pressure, accident history can provide a valid basis, in combination with toxicity and/or physical/chemical properties, for adding a substance to the list. The Agency also notes that nothing in the statute limits EPA to consider solely the effects of vapor inhalation as a consequence of a release. As noted above, the EHS toxicity criteria endorsed by the Senate are not limited to inhalation. Furthermore, death, injuries, and environmental impacts caused by direct contact are relevant to the risks posed by a chemical.

While believing the EPA has the authority to list sulfuric acid if its accident history, in conjunction with its toxicity and significant production volume, warrants listing, the comments received by the Agency have created doubt about the accuracy of what has been reported as air releases of sulfuric acid. For purposes of today's rulemaking, the Agency has been unable to determine from accident history whether sulfuric acid has generated an air release that has caused impact off-site. Because of the uncertainty associated with past reported accidental release information and the common confusion between oleum and sulfuric acid in such reporting, the Agency has decided not to list sulfuric acid at this time. Although sulfuric acid is not specifically listed, facilities handling sulfuric acid are still subject to general duty requirements. The Agency will continue to monitor and review sulfuric acid accident reports to determine the need for listing at a future time. EPA also seeks data on the off-site impacts of sulfuric acid that could be used to evaluate whether sulfuric acid should be added to the list.

Related to the sulfuric acid issue are comments suggesting that the Agency specifically list oleum (fuming sulfuric acid), CAS number 8014-95-7. Oleum is a mixture of sulfuric acid and sulfur trioxide. In the proposed rule, the Agency believed oleum would be subject to section 112(r) requirements because both of its components, sulfuric acid and sulfur trioxide, were proposed for listing, and because of the Agency's proposed de-minimis concentration for mixtures. However, two commenters noted that it is "reasonable to include oleum as a regulated chemical" and that "oleum and sulfuric acid must be listed separately, since the fuming effects of an oleum release make it potentially much more serious." The Agency agrees with commenters that oleum should be include in this listing because of its accident history, toxicity, and production volume. Furthermore, the Agency has reviewed the accident history data relevant to oleum and sulfuric acid and agrees with commenters that some of the accidents the Agency had relied on to list sulfuric acid in fact involved oleum. Furthermore, because of the revisions on the de-minimis concentration provisions and the Agency's decision not to finalize the listing of sulfuric acid at this time, oleum would no longer be subject to 112(r) provisions without a specific listing. In order to continue the coverage of oleum in the accidental release prevention provisions, EPA is specifically listing all forms of oleum in the section 112(r) list of substances.

Phenol (in liquid form only), parathion, and nitrobenzene are also included on the proposed list based on accident history. Several commenters objected to the inclusion of these chemicals, for reasons similar to those concerning the listing of sulfuric acid, i.e., the low vapor pressure of these substances and the lack of sufficient supporting accident history to provide a basis for listing. The Agency generally agrees with the comments regarding these three specific substances. Having considered the comments and having conducted further review of accident history for these chemicals, the record indicates that there are not a clearly significant number of accident reports with effects, or potential effects, beyond the fenceline to merit listing at this time.

Several commenters objected to the listing of other specific substances for a variety of reasons, including low vapor pressure, low toxicity, existing safety regulations, and accident history. The chemicals mentioned include hydrogen peroxide, acrylonitrile, and hydrochloric acid, among others. EPA has reviewed the comments on these chemicals and categories of chemicals that were recommended for deletion and has decided to, except as noted, retain them on the list of regulated substances under section 112(r). As noted above, EPA is revising the vapor pressure criterion and not proceeding to list 18 chemicals with vapor pressures below 10 mm Hg. In addition, the Agency has determined that section 112(r)(3) prohibits it from listing methyl bromide because the substance has been listed by regulation as an ozone depleting chemical under CAA Title VI (see 58 FR 65018, December 10, 1993).

The Agency disagrees with commenters that seek deleting substances because of other existing regulations. The listing of substances and thresholds, as mandated by Congress, reflects the potential for these listed substances to cause serious adverse effects to human health or the environment. The Agency believes that considerations of other regulations applicable to these regulated substances are appropriately accounted for in accident prevention requirements developed for facilities handling the regulated substances above the threshold quantities, rather than in determining whether any listed substance poses a potential hazard.

Several commenters recommended the deletion of substances that were mandated for listing by Congress, including ammonia, toluene diisocyanate, and anhydrous sulfur dioxide. The Agency believes that the language of section 112(r)(3) precludes it from omitting these chemicals from the initial list. The Agency will consider petitions to delist these chemicals if such petitions comply with the petition criteria announced today.

Several commenters recommended adding other specific substances, such as chlordane and tetraethyl lead, to the list of regulated substances. The Agency will consider these at the time it revises the list promulgated today, or through the petition process. However, the Agency notes that notwithstanding today's listing, these substances are still subject to the general duty provisions, particularly if they are in commercial production and use.

In the list rule proposal, EPA requested information to determine the need and appropriateness of including radionuclides under this rulemaking. Some commenters objected to including radionuclides while others recommended inclusion. Still other commenters recommended the inclusion of only some radionuclides. However, none of the commenters provided sufficient technical information to assist the Agency in determining whether or not radionuclides should be listed. Due to the uncertainty associated with gaps in EPA's data and the appropriate criteria for listing, the Agency has decided not to include radionuclides in the initial list of regulated substances.

c. Other List Options Considered. EPA considered the option of adopting the entire list of 360 toxic chemicals regulated under EPCRA (SARA Title III) section 302. A small number of commenters favored this option, believing that consistency with EPCRA is desirable, that having a single list would help avoid confusion, and that listing additional toxic substances would be more protective of the public. EPA did not propose to adopt the entire EHS list because it includes a number of solids and non-volatile liquids for which an effect beyond the fence line in the event of an accidental release is expected to be less likely than for gaseous or volatile liquids. It also includes substances that are not currently in commercial production. Congress did not direct EPA to list all EHS substances. Instead, Congress provided that the Administrator could include as few as 100 substances on the initial list under section 112(r). In directing the Administrator to "use" the EHS list, but not to be "limited to" this list, and in providing that "such modifications as ... appropriate" be made, the CAA provides the Agency with the flexibility to cull from the EHS list and other sources a more focused list of substances for accidental release prevention regulations. Most commenters supported EPA's decision to propose for listing only those EHSs that best reflect the statutory criteria of likelihood and magnitude of release. For these reasons, EPA is not adopting the entire EHS list.

d. Threshold Quantities. EPA's proposed thresholds were lower than OSHA's for 15 of the substances listed by both OSHA and EPA. A number of commenters stated that EPA's thresholds should not be lower than OSHA's for any listed substances, since in general, workers face a more immediate threat of exposure in an accidental release than would the public. Several commenters indicated that EPA should adopt the OSHA thresholds for chemicals which EPA had assigned lower thresholds. Conversely, there

were other comments supporting the lower thresholds proposed by EPA for several chemicals, based on the commenters' experience with these chemicals.

EPA has reviewed the threshold quantities for the listed substances and the OSHA thresholds for the substances on both the EPA and OSHA lists prior to and after the proposal of EPA's rule. EPA recognizes the practical importance of consistency with the OSHA list to the extent possible, but also believes it is necessary to have a sound methodology for assignment of threshold quantities; the CAA requires the Agency to include an explanation of the basis for establishing the list, and to account for specified factors in setting threshold quantities. OSHA's thresholds were not required to reflect the factors EPA must consider. The statute also provides for petitions to add new chemicals, and requires the development of thresholds for such chemicals when listed. A sound methodology is essential for making changes to the list and thresholds after promulgation. The methodology adopted today considers the factors required by the CAA under section 112(r)(5). No other methodology was identified that EPA could use to derive thresholds that would be consistent and equally applicable to the current listed substances and to those that may be added in the future. Therefore, EPA is not adopting the OSHA thresholds.

Nevertheless, EPA agrees with commenters that EPA should review its proposed threshold methodology and quantity categories to ensure that they accurately reflect the range of risks posed by the listed toxic substances. Based on this review, EPA has decided to retain its threshold methodology but revise the range of threshold quantities for toxics. The minimum quantity remains at 500 pounds, representative of drum-size containers, but the maximum threshold quantity is raised to 20,000 pounds, replacing the proposed 10,000 pound maximum. This higher upper limit expands the range of threshold quantities to better reflect the relative hazards among the listed toxics; the upper limit of 20,000 represents typical handling quantities, and would still be protective of the public for those substances which now have the higher thresholds. Threshold quantity categories for toxic substances are now: 500 pounds, 1,000 pounds, 2,500 pounds, 5,000 pounds, 10,000 pounds, 15,000 pounds, and 20,000 pounds.

Using this revised range, higher thresholds have been assigned for most of the toxic substances listed based on the revised vapor pressure criterion. Several toxic substances also meet the flammability criteria, and thus could be assigned two thresholds. Toxic substances that also meet the criteria for listing as flammable substances are assigned the lower of the thresholds. Under the revised methodology, the only substance that has a threshold quantity that is lower under EPA than OSHA's PSM standard is methyl chloride, which meets the criteria for listing for flammability and, therefore, is assigned a threshold quantity of 10,000 pounds, rather than the 20,000 pounds that would apply under the methodology for toxics. The OSHA threshold for methyl chloride is 15,000 pounds. This is to account for those hazards presented by the substance that are considered in this rulemaking; the lowest threshold quantity is assigned to be more protective.

A number of commenters suggested that site-specific factors should be considered in setting or modifying thresholds, such as population density, ecosystem sensitivity, safety devices, experience, uses of the substance, and handling conditions. EPA recognizes that these and many other site-specific factors could affect the likelihood of occurrence or the effects of a release. Accounting for these factors

has the advantage of more specifically tailoring threshold quantities based on common use patterns of the substances and on the particular site in which they would be used. One serious disadvantage of applying site-specific factors to setting thresholds would be that such an approach would be inappropriate for ubiquitous chemicals, such as chlorine and ammonia, because of the innumerable applications that would have to be considered. A greater disadvantage to this approach is that the intrinsic hazard of a chemical will still be present even when it is used outside of a "typical" scenario. As stated in the proposed rule, EPA believes it is not feasible to develop a methodology for establishing threshold quantities based on site-specific factors that would be applicable uniformly nationwide. Therefore, EPA did not incorporate site-specific factors in setting or modifying thresholds. As discussed in the preamble section *IV.B. Threshold Determination*, substance-specific factors and use scenarios are considered in determining whether there is a threshold quantity on-site. Also, site specific factors will more appropriately be accounted for in the accidental release prevention regulations under section 112(r) (7). This Agency rationale is also applicable to similar comments for establishing thresholds for flammable and explosive substances.

e. Other Threshold Quantity Options Considered. In addition to the proposed methodology for setting thresholds for toxic substances and the use of OSHA thresholds as discussed above, EPA requested comment on several other options. One option was use of the vapor quantity method, based on air dispersion modeling, to determine the quantity in air needed to equal the "Immediately Dangerous to Life and Health" (IDLH, published by the National Institute for Occupational Safety and Health) concentration level at 100 meters from the point of release. This option was not generally supported by commenters. A second option was to adopt the threshold planning quantities (TPQs) under EPCRA section 302. A small number of commenters favored this option, believing that consistency with EPCRA would help to avoid confusion. EPA did not propose this option because the TPQs are intended to represent a level at which the chemical hazards should be considered by localities for discretionary community planning purposes. As mentioned in the preamble of the proposed rule, the thresholds established under this rule have a different purpose, i.e., to indicate which facilities must comply with mandatory facility-based prevention requirements. Any confusion that results from two different threshold quantities applying to the same chemical under two EPA emergency preparedness and prevention programs is mitigated by the fact that the more onerous and detailed planning requirements are triggered when greater, and presumably more dangerous, quantities are present.

The third threshold option considered for toxics was adoption of the OSHA thresholds for all substances listed by both EPA and OSHA. A number of commenters favored this option. As noted above, EPA recognizes the importance of consistency with OSHA. However, because of EPA's statutory obligation to establish a methodology based on specified factors, the Agency has elected not to adopt the OSHA thresholds. The thresholds adopted in today's rule for chemicals listed by EPA are, with the exception of methyl chloride, equal to or higher than OSHA's.

2. Flammable Substances

EPA's listing of flammable gases and volatile flammable liquids was generally supported by commenters, although a few commenters maintained that, because OSHA regulates flammable

substances, EPA should not list them. The Agency disagrees that flammable substances should not be listed for accident prevention and potential effects off-site, since such substances pose a potential off-site hazard (namely, a vapor cloud explosion) because of their inherent properties. The proposed threshold for flammables, 10,000 pounds, was generally supported as well. EPA is finalizing the proposed listing for flammables and their threshold quantities.

Commenters also focused on specific flammable substances, including methane, ethane, propane, and butane (some components of natural gas). Commenters argued that special factors (e.g., the low density of methane gas) justify not listing or modifying the listing of these substances. EPA has reviewed the comments on specific flammable substances and disagrees with the commenters. EPA believes there is sufficient information, from both accident reports and modeling results, to support the conclusion that flammable substances that meet the listing criteria, in quantities above the threshold quantity of 10,000 pounds, could present a hazard to the public from a vapor cloud explosion. EPA recognizes that, as noted by commenters, some situations in which these substances are handled may present a lesser hazard than others. However, these substances still pose a potential threat beyond the fence line in case of an accidental release. Therefore, in order to be protective of the public, EPA is maintaining the same application of the criteria for flammable substances as proposed for all listed flammable substances. EPA's listing decision is based on the substances' demonstrated or potential effects in the event of an accidental release, not on existing regulations, standards, or recommended practices applicable to the listed substances; these factors may more appropriately be accounted for when accident prevention regulations are promulgated under section 112(r)(7).

Several commenters recommended that EPA provide an exemption, similar to the exemption under OSHA's PSM Standard, for flammable liquids kept in atmospheric tanks below their normal boiling points. Unlike OSHA, EPA is listing only flammable gases and volatile flammable liquids. EPA considers these substances to be intrinsically hazardous, regardless of conditions of storage, and, therefore, does not believe it is appropriate to provide an exemption for atmospheric storage.

3. Explosives

Explosives classified by DOT as Class 1, Division 1.1 and listed as such in 49 CFR 172.101 (the *Hazardous Materials Table*) are covered by this rule with a threshold of 5,000 pounds. In 49 CFR Part 173.50, DOT defines the term "explosive" as any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classed under DOT provisions. Division 1.1 consists of explosives with a mass explosion hazard; a mass explosion is one which affects almost the entire load instantaneously. The Agency proposed to list all substances that met the definition of Division 1.1 (58 FR 5110). The Agency is clarifying and modifying its listing of explosive substances to include only those substances listed in 49 CFR Part 172.101 (DOT's Hazardous Material Table), which is a subset of all substances and mixtures of substances that would meet DOT's Division 1.1 definition.

EPA noted in the preamble to the proposed rule that it believed this threshold would apply primarily to manufacturers of high explosives (58 FR 5112). More than 100 commenters, primarily explosives distributors and users, objected to the listing of explosives in general. These commenters maintained that explosives are regulated adequately by a number of agencies, including the Bureau of Alcohol, Tobacco, and Firearms (BATF), DOT, OSHA, the Mine Safety and Health Administration (MSHA), and the Department of Defense (DOD). The commenters believe the requirements of the existing regulations serve to prevent accidents and cited the safety record of the explosives industry as evidence. The commenters believe the American Table of Distances, used by BATF to set distances for storage of explosives, provides protection for the community from the effects of an accidental explosion; this table is based on a lower overpressure level than the 3.0 psi used by EPA to set the threshold for explosives and, therefore, is more protective of the public. In addition, a number of commenters said the 5,000-pound threshold proposed by EPA would not restrict the effects of the rule to manufacturers, as suggested by EPA, but would also cover many distribution and use sites. They noted that, for example, blasting may require only a small quantity of high explosive (Division 1.1), but that the entire quantity of explosives on-site used in blasting is treated as a high explosive; the high explosive portion serves to initiate the reaction involving the entire quantity.

EPA acknowledged in the proposed rule that explosives are already regulated by a number of agencies. However, these existing regulations do not negate the properties of these substances. The explosives listed in today's rule meet the criteria of section 112(r)(3) and (4) because the inherent properties of the listed explosives plainly indicate that such chemicals may have a severe impact in the event of a detonation. The listed explosives represent the category of explosives that may most easily detonate. In the event of an accidental detonation these substances pose an inherent risk of off-site effects. Industry requirements under other applicable regulations, or recommended standards, are more appropriately accounted for in the development of accidental release prevention requirements. The requirements for accident prevention in section 112(r)(7) specifically allow for recognition of industry-specific circumstances, including voluntary prevention measures, in EPA's prevention regulations. No similar provision is set forth in sections 112(r)(3), (4), or (5), which covers the development of this list of substances and thresholds quantities. Section 112(r)(7) implementing rules, as appropriate, will allow for industry specific circumstances to be considered. Other regulatory requirements, and other practices already in place aimed specifically at protecting the public from adverse effects in case of accidental releases are expected to be integrated with accident prevention requirements of rulemaking under section 112(r)(7).

In particular, EPA's review of existing regulations indicates that public safety would be enhanced if additional information about explosives, such as hazards assessments, were available to emergency response agencies and local emergency planners. Public safety would also be enhanced if there were additional coordination between facilities handling explosives and the local emergency planners and responders. The listing of explosives will make information available under section 112(r) rulemaking and facilitate this coordination. Furthermore, current regulations do not provide for public communication of potential off-site hazards, as do CAA Amendments requirements under section 112(r)(7). Currently, only information related to the quantity and location of explosives is available to the public under sections 311 and 312 of EPCRA. Under the risk management provisions of the CAA, the

public will also have available to them information about the measures being taken by the facility to prevent off-site consequences from accidental detonations.

The Agency has noted that the practice of treating the entire quantity of mixtures of high explosives with other explosives as high explosives, coupled with the Agency's proposed threshold determination rule for mixtures, creates the potential for coverage of explosive formulations that are intended to be released (exploded) on-site. The Agency did not intend such coverage in its proposal. In response to this problem identified by the commenters, the Agency is modifying the listing of explosives in today's final rule so that specific explosives on the Hazardous Materials Table are identified as the regulated substances. This avoids the potential circularity in the proposed definition. Mixtures with substances listed on the Hazardous Materials Table are potentially covered only through the operation of the explosive mixture provision in the threshold determination portion of today's rule. The Agency is also clarifying the coverage of explosive mixtures to be used for intentional on-site detonations (not an accidental release) when determining if a threshold quantity is present in a process. This clarification is discussed later in today's preamble.

B. Threshold Determination

Section 68.115 was originally proposed as section 68.5. It has been consolidated with other subpart C provisions that relate to covered substances and applicable thresholds. This section of the regulation establishes how to estimate the presence of a threshold quantity. Exemptions of those quantities that need not be accounted for in determining a threshold are also included.

1. Basis for Threshold Determination

Comments on the proposed rule generally supported a threshold quantity determination that is based on the quantity of a regulated substance in a process. Some commenters, however, suggested that determining threshold quantities should be based on the quantity on-site, the average annual usage, or on-site specific factors. EPA generally disagrees with these statements. The total quantity on-site, while consistent with other regulations in determining threshold quantities (particularly EPCRA, section 302) does not necessarily represent the quantity that could be involved in an accident. The total quantity on-site may include quantities in separate processes, buildings, and locations within the same facility. The average annual usage measures the quantity used by a facility in a year and is not related to the maximum quantity that could be released at a given time. Site-specific factors are appropriately accounted for both in defining the process for which a threshold calculation must be undertaken and in assessing the hazards and preparing the risk management plan for the particular facility. As recommended by most commenters, EPA is retaining the threshold determination based on the total quantity in a process, using the same process definition as OSHA. This approach focuses on the quantity of a substance that might be released in a single accident, and that could be reasonably anticipated to cause effects of concern as a result of an accidental release. This threshold determination approach is consistent with OSHA's PSM standard.

2. Mixture Exemption

a. Toxic Substances. The proposed rule included a de-minimis concentration of one percent by weight for all listed substances present in a mixture; i.e., quantities of a regulated substance in a mixture did not have to be accounted for purposes of the threshold quantity if the substance were present at concentrations below one percent by weight. A number of comments were received on this exemption for solutions and mixtures.

Several commenters suggested providing a threshold determination method for mixtures based on the SHI. The partial pressure of the listed substance in solution and its toxicity would be used to determine the value of the SHI for the solution; the index value would be compared to a cut-off value (commenters recommended a cut-off of 1,000). EPA does not agree that the SHI criteria should be used to determine the mixture cut-off. Because the SHI approach was not used in determining which chemicals to list, a mixture's score based on this index would not relate to whether a chemical met the listing criteria. EPA also remains concerned about the lack of a basis for the recommended 1,000 SHI cut-off. In addition, EPA believes the SHI approach would be difficult to implement within the structure of section 112(r), especially for facilities outside the chemical manufacturing industry.

Most of the commenters believed the one percent concentration cut-off is too low for solutions of toxic substances; their position being that one percent mixtures of a regulated substance pose essentially no threat to the public. Several commenters also suggested that EPA should provide specific concentration cut-offs for solutions of certain listed substances, such as hydrogen fluoride, nitric acid, and sulfuric acid. Several commenters suggested that the concentration cut-offs should be raised for hydrochloric acid (listed for concentrations of 25 percent or greater) and ammonia (listed for concentrations of 20 percent or greater).

The Agency agrees with commenters that the one percent cut-off may prove to be too conservative in certain circumstances, and that it may not adequately reflect the decreased potential for air release of most regulated substances in dilute mixtures or solutions; at very low concentrations some of these mixtures or solutions fail to meet the listing criteria. The Agency also believes, however, that no justification would exist to exclude the quantities in mixtures or solutions from the threshold calculation if it is uncertain that these mixtures or solutions fail to meet the original listing criteria.

In response to these comments, EPA has modified the one percent mixture exemption to reflect the amount of the regulated substance that may reasonably be anticipated to cause an effect of concern in an accidental release. The Agency has reassessed the concentration at which certain dilute solutions of regulated substances may pose a hazard to the community, sufficient to warrant treatment as a regulated substance, for purposes of determining whether a threshold quantity is present in a process. As part of this modification, EPA has decided to provide specific cut-off concentrations for certain chemicals. These chemicals, in mixtures or solutions with concentrations below the specified cut-off, will not have to be considered in determining whether a threshold quantity is present. For other chemicals, a method, rather than a specific cut-off, will be provided to determine whether mixtures should be considered in

the threshold determination. The following chemicals are now listed with concentration cut-offs (in addition to those already proposed with concentrations cut-offs) as shown for weight percent of the substances in water solution:

Hydrogen fluoride/Hydrofluoric acid (concentration 50 percent or greater); the listing of hydrogen fluoride has been clarified to reflect that it includes the aqueous form of hydrogen fluoride, hydrofluoric acid.

- Nitric acid (concentration 80 percent or greater)

The concentration limits for hydrofluoric and nitric acid are based on the partial pressures of these substances in water solution. At the concentrations listed, the partial pressures of the solutions would meet the vapor pressure criterion of 10 mm Hg. Also, EPA is raising the proposed concentration cut-off for hydrochloric acid from 25 to 30 percent, based on water solutions, to meet the revised vapor pressure criterion. EPA is not changing the concentration cut-off for ammonia because the partial pressure of ammonia in a 20 percent solution still exceeds the 10 mm Hg vapor pressure criterion.

Other listed toxic substances in solutions or mixtures must be included in threshold determination if the partial pressure of the substance in the solution or mixture is equal to, or exceeds, 10 mm Hg. If the partial pressure of the regulated toxic substance in the mixture is determined to be below 10 mm Hg under all conditions in process handling or process storage, the solution or mixture need not be considered in the threshold determination. If the partial pressure of the regulated toxic substance in the mixture equals or exceeds 10 mm Hg in portions of the process, then the quantity of the listed substance contained in the mixture at these portions of the process shall be included in determining whether a threshold is met. The facility will be required to use the one percent de-minimis concentration in determining threshold quantities unless it can measure or estimate, and document, that the partial pressure of the regulated substance in the mixture or solution is less than 10 mm Hg.

The methodology for determining the amount of a regulated substance in a mixture to apply to thresholds does not apply to oleum, toluene 2,4-diisocyanate, toluene 2,6-diisocyanate, and toluene diisocyanate (unspecified isomer). These substances have vapor pressures less than 10 mm Hg.

b. Flammable Substances. The proposed rule included the same de-minimis concentration of one percent by weight for all listed substances present in a mixture for flammable substances. A number of commenters noted that mixtures of flammable substances in concentrations above one percent may not be flammable. They suggested that a listed flammable substance in a mixture should be included in threshold determination only if the mixture meets the flammability criteria for listing. Other commenters suggested that the entire mixture containing a listed substance should be treated as a regulated substance if the mixture meets the listing criteria for flammable substances. EPA agrees that a mixture containing a listed flammable substance should only be considered in a threshold determination if the mixture itself meets the criteria for an NFPA flammability rating of 4, i.e., flash point below 22.8°C (73°F) and boiling point below 37.8°C (100°F). Again, as for the toxics in mixtures or solutions, a facility is

required to use the one percent de-minimis concentration for threshold quantity calculations unless it can measure or estimate, and document, that the mixture or solution does not have a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F).

The Agency agrees with commenters who suggested that a mixture containing a flammable regulated substance should be treated as the regulated substance for purposes of determining whether a threshold quantity is present if the mixture itself meets the boiling point and flash point criteria of today's rule. EPA believes the hazards associated with such highly flammable mixtures make it appropriate to treat such mixtures as regulated substances when such mixtures meet the flammability listing criteria. EPA recognizes that counting the entire quantity of a flammable mixture for threshold determination differs from the proposed rule and from the treatment of mixtures containing regulated toxic substances. However, the Agency believes this different treatment is appropriate because, for flammable substance mixtures, the mixture is known to display the flammability hazard at levels that meet the listing criteria, while for toxic substance mixtures, the mixture is not known to meet the acute toxicity criterion. For toxic substance mixtures, EPA requires counting towards a threshold only the portion of the mixture that would meet the acute toxicity criterion (i.e., the amount of the actual substance).

c. Explosive Substances. A number of comments were received regarding the threshold calculations for explosives, particularly for mixtures of division 1.1 explosives with low explosives or blasting agents at use sites. In the proposed rule, the Agency had established a de-minimis concentration applicable to all listed substances. Commenters pointed out problems with this mixture consideration, in light of EPA's listing of all explosives meeting DOT's definition of Division 1.1 hazardous materials. This definition treats the entire quantity of a mixture containing a high explosive as a Division 1.1 explosive, hence negating the de-minimis calculation for purposes of threshold quantity determinations. This affected particularly those mixtures formulated on-site, prior to intentional detonations, following BATF regulations. To minimize the potential for accidents, these mixtures generally are made shortly before intentional on-site explosions. The Agency recognizes that the intentional release (or controlled release) in an explosion of mixtures containing a regulated substance is not an accidental release. Thus, the Agency believes that the amount of an explosive in such a mixture cannot be reasonably anticipated to cause effects of concern as a result of an accidental release when such quantities are intended to be released on-site. Therefore, in addition to clarifying the listing of explosives only to include those substances listed by DOT in 49 CFR 172.101, the Agency is also clarifying the applicability of the mixture concentration provision for explosives. For purposes of determining whether a threshold quantity is present in a process involving explosives, mixtures of Division 1.1 explosives listed by DOT in 49 CFR 172.101 (Hazardous Material Table) and other explosives need not to be included when the mixture is intended to be used in an on-site non-accidental release in a manner consistent with applicable BATF regulations. Quantities of explosive regulated substances in mixtures that are not intended to be used on-site in an intentional explosion would not be exempt if such mixture would be treated as a Division 1.1 explosive under 49 CFR parts 172 and 173.

The following two examples demonstrate how this threshold determination provision would operate. An owner or operator of a stationary source receives a mixture, or prepares a mixture, that combines a small quantity of an explosive listed as Division 1.1 hazardous material in 49 CFR 172.101 with a large

quantity of a blasting agent, so that the total quantity is above the 5,000 lbs threshold quantity established for listed explosives. If the owner or operator intends to detonate the high explosive/blasting agent mixture at the stationary source in a manner that is consistent with applicable BATF regulations, then the owner or operator need not count the weight of the mixture in determining whether the source has a threshold quantity of the regulated substance on-site. If the owner or operator intends to store, and then transport off-site the high explosive/blasting agent mixture, and the entire mixture would be treated as Division 1.1 explosive under applicable DOT regulations, then the weight of the entire mixture would need to be calculated to determine whether a threshold quantity is present.

3. Other Threshold Exemptions

Except as noted below, all other threshold exemptions in the proposed rule are retained in the final rule. All comments received concerning these exemptions favored the Agency's proposal. The Agency continues to believe that the forms of regulated substances exempted in today's rule cannot reasonably be anticipated to cause effects of concern in the event of an accidental release.

Use for facility consumption as fuel: The Agency has deferred a decision on the proposed exemption for listed flammable substances when used solely for facility consumption as fuel. For a document relating to this proposed exemption, see a supplemental notice published elsewhere in this issue. The Agency intends to decide on whether to promulgate this exemption on or before the date the final risk management program rule is promulgated.

C. Petition Process

Section 68.120 of the rule establishes the specific administrative and technical requirements for the submission of petitions to add or delete substances from the list of regulated substances.

Several comments were received on the criteria for determining whether a substance that is the subject of a petition should be listed or delisted. Two commenters said the listing criteria are too narrow. For example, it was argued that EPA should allow petitioners to develop a case for listing toxic chemicals that do not meet the acute toxicity criteria. Another commenter said the listing criteria are too broad, and the standards for delisting are too stringent; delisting requires demonstrating that the substance "will not" cause death, injury, or environmental harm.

EPA believes the acute toxicity criteria for listing toxics, as well as the volatility and accident history, provide a valid basis for identification of chemicals that pose hazards to the community in case of acute exposures resulting from an accidental release and is retaining these criteria for petition review. The Agency is also retaining the selection criteria for listing flammables and explosives. EPA agrees that the petition requirements for delisting may be too stringent and will delete substances from the list if it can be determined that the substance, in case of an accidental release, "is not known or anticipated to" cause death, injury, or serious adverse effects to human health or the environment.

One commenter said the decision not to accept additional petitions unless new data become available should be modified so that petitions that present significant data not previously considered (whether or not the data are new) can be accepted. The petition process provides that when a petition is received, EPA will publish a notice in the FEDERAL REGISTER requesting additional, pertinent scientific information that was not identified by the petitioner. Interested parties will have the opportunity to present significant data not included in the petition. Therefore, EPA believes it is appropriate to accept additional petitions on a substance only if new data become available.

Another commenter said the 18-month period proposed for review of petitions should be shortened to six months. EPA believes the 18-month review period is not excessive for carrying out a thorough review of the petition and any public comments and publishing a decision concerning the petition. Denials shall be published in the Federal Register within 18 months of the Agency receiving the petition; for petitions granted, the Agency will publish a proposed new listing within 18 months.

D. Definitions

Section 68.3 of the regulation sets forth the definitions that will apply to all regulations published under section 112(r). Some of the terms used in other parts of the CAA are also applicable to section 112(r). In addition, a number of terms new to the CAA, resulting from the implementation of section 112(r), are defined in section 68.3 for purposes of all accidental release prevention regulations. These definitions include terms necessary to communicate effectively the new regulatory requirements.

Accidental Release: The definition proposed for accidental release has been taken directly from the legislative language. Several commenters, however, thought it appropriate that the Agency clarify this definition to better focus on EPA's intent through this regulation. Several commenters submitted that the definition of accidental release should be clarified not to include routine emissions to the environment. The Agency believes that the definition is clear in specifying that an accidental release is an "unanticipated emission" of a regulated substance and that this would not include routine emissions. Several commenters also had concerns regarding the inclusion of the term "other extremely hazardous substances" in the definition of accidental release. This term has also been taken directly from the legislative language and the Agency believes it to be an important component of this definition. Under section 112(r)(1) the owners and operators of stationary sources have a duty to initiate specific activities to prevent and mitigate accidental releases of any regulated substance under 112(r)(3), or any other extremely hazardous substance.

Process: There were a number of comments related to EPA's definition of process. The proposed definition was consistent with OSHA's definition of process under their PSM standard, and included any activity involving a regulated substance including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities. Any group of vessels that is interconnected, or separate vessels that are located such that a regulated substance could be involved in a potential release, were proposed to be considered a single process. Because of the need to maintain as much consistency as possible with OSHA, EPA is retaining this definition and is providing, in this

preamble, some clarification prompted by comments submitted on this issue.

Many commenters argued that the proposed definition included terms that were not clear, such as interconnected vessels and single processes. The commenters indicated, for example, that in some cases vessels may be connected in indirect ways and still present a low probability that they could be involved in a single release. The Agency believes that this was already accounted for through the proposed definition of process. To serve as clarification, interconnected vessels that could be involved in a single release would include vessels physically connected so that an event could lead to an accidental release involving all these vessels at one time. The Agency still believes that the facility is responsible in accounting for any quantity of a regulated substance that could potentially be released from one or more vessels, whether these are connected or not.

Stationary source: Several commenters requested clarification regarding pipelines and whether listed flammable substances in pipeline transfer stations would be covered by the rule under the stationary source definition. Other commenters had questions regarding the inclusion in this definition of transportation containers not under active shipping orders. The Agency is clarifying the definition of stationary source. For purposes of regulations under section 112(r), the term stationary source does not apply to transportation conditions, which would include storage incident to such transportation, of any 112(r) regulated substance. Pipelines, transfer stations, and other activities already covered under DOT as transportation of hazardous substances by pipeline, or incident to such transportation, under 49 CFR Parts 192, 193 and 195 would not be covered. Transportation containers that are not under active shipping papers are not considered by EPA to be storage incident to transportation; the Agency considers the definition of stationary source to include such containers.

E. Exemptions

The Agency is retaining the proposed exemption from this part for ammonia used as an agricultural nutrient, when held by farmers. This exemption was authorized by statute, and it was also generally supported by commenters.

A number of commenters suggested that an exemption should be added for natural gas, mainly because of other existing regulations. As discussed previously in this preamble, EPA's listing of a substance is based on the demonstrated or potential effects in the event of an accidental release. Existing regulations may be targeted to reduce a potential release, or the effects of a release, but do not negate the hazards presented by the substances regulated. Existing requirements under other regulations, standards, or recommended practices are to be accounted for though the requirements of the risk management program and any other prevention regulations under section 112(r).

F. Scope

An issue of concern to a number of commenters were the general duty requirements under section 112(r) (1). Generally, commenters voiced some confusion regarding what the requirements would be, and

particularly about which substances would be included. Because of similarities with OSHA's general duty clause, commenters expressed the need for EPA to develop guidance along the OSHA Field Operations Manual to assist facilities in evaluating their compliance with these requirements.

The CAA identified the following activities as part of the general duty requirements: identification of hazards which may result from an accidental release using appropriate hazard assessment techniques, designing and maintaining a safe facility taking such steps as necessary to prevent accidental releases, and actions which minimize the consequences of an accidental release once it has occurred. Section 112(r)(1) specifically indicates that the general duty provision applies in the same manner and to the same extent as OSHA's general duty clause under section 654, Title 29 of the U.S. Code. The Agency is investigating the relationship between requirements under section 112(r) and OSHA's general duty provisions.

Comments were also received on the separate issuance of the list and thresholds rule and the risk management program rule. The comments focused on the difficulties for the regulated community to evaluate and comment on the full impact of the list and thresholds without specific information on the accident prevention requirements. The Agency agrees that the separation of these rules does not allow the regulated community the optimum opportunity to comment on the proposed regulation. While the Agency recognizes that the two rules comprise a single program, the statute allows for proposal and promulgation of the list and thresholds rule prior to the proposal and promulgation of the section 112(r)(7) rule. Because EPA's duty to publish the list and thresholds rule arose before the duty to publish the risk management program rule, the Agency was obligated to publish the proposed list and thresholds rule before the section 112(r)(7)(B) proposed rule was publishable. The Agency has just published a proposed notice for the prevention requirements applicable to facilities having the listed substances above the threshold quantities (*Risk Management Programs for Chemical Accidental Release Prevention*, 58 FR 54190, October 20, 1993). The comment period for the risk management program rule will be open at the time this rule is finalized. This will give commenters the opportunity to comment on the risk management program with the knowledge of what substances are covered.

V. Summary of Provisions of the Final Rule

EPA is adding part 68 to title 40 of the Code of Federal Regulations, including the list of regulated substances and threshold quantities, as well as the requirements for the petition process to add regulated substances to the list or to delete regulated substances from the list.

Section 68.1 establishes the scope of the Part 68 chemical accident prevention provisions.

Section 68.3 establishes definitions applicable to all Part 68 regulations.

Section 68.100 establishes the purpose of the subpart as the designation of regulated substances and their threshold quantities, and establishment of the requirements for petitions to add substances or delete substances from the list.

Section 68.115 (proposed 68.5) establishes the procedures to determine whether a threshold quantity of a regulated substance is present at a stationary source. Specific exemptions to the threshold determination procedure are also included for mixture concentrations, articles, and certain uses and activities.

The final rule includes several exemptions for mixtures that have been revised from the proposed rule. These are: (1) for toxic substances present in a mixture or solution at a concentration of one percent or greater by weight, the facility has the option of demonstrating that the partial pressure of the regulated substance in the solution under any or all storage or handling conditions is less than 10 mm Hg; in this case, the quantity of the regulated substance in the mixture in the portion of the process with a partial pressure of less than 10 mm Hg would be exempt from threshold determination; (2) mixtures containing regulated flammable substances are exempt from threshold determination if the facility demonstrates that the mixture itself does not meet the criteria for flammability (flash point below 73°F (22.8°C) and boiling point below 100°F (37.8°C)); and (3) mixtures of Division 1.1 explosives listed in 49 CFR 172.101 and other explosives need not be considered when determining whether a threshold quantity is present, provided that the mixture is intended to be intentionally released (i.e., a non-accidental release) in a manner consistent with DOT and BATF regulations.

Section 68.120 specifies the requirements for petitions to the Agency to add substances to the list, and to delete substances from the list. Petition requirements have been modified slightly to read that a substance may be deleted from the list if adequate data are available to determine that the substance, in the case of an accidental release, is "unlikely to cause" (rather than "will not cause") death, injury, or serious adverse effects to human health or the environment.

Section 68.125 exempts ammonia used as an agricultural nutrient when held by a farmer.

Section 68.130 establishes the list of regulated substances, including a list of toxic substances, a list of flammable substances, and a list criterion for commercial high explosives. This section also establishes the threshold quantities for all listed substances.

The final rule includes several changes to the proposed list and thresholds. Eighteen substances, with vapor pressures below 10 mm Hg, have been deleted from the proposed list of toxic substances, and one substance (vinyl chloride) has been moved from the list of toxic substances to the list of flammable substances. One substance, methyl bromide, has been deleted because it is listed under Title VI of the CAA. Four substances on the proposed list, included partly because of their accident history, have been deleted while another, oleum, has been specifically listed. The final list contains 77 toxic substances. Concentration cut-off levels have been specified for solutions of two additional substances, hydrogen fluoride and nitric acid. The concentration cut-off level has been raised for hydrochloric acid from 25 to 30 percent by weight. Threshold quantities have been raised for 71 of the 77 toxic substances listed. The final list contains 63 flammable substances, with the threshold quantity remaining at 10,000 lbs. The listing of explosive substances has been modified only to include those substances listed by DOT in 49 CFR 172.101; the Agency is also clarifying the applicability of the mixture concentration provision for explosives.

VI. Required Analyses

A. E.O. 12866

Under Executive Order 12866, 58 Federal Register 51735 (October 4, 1993), the Agency must determine whether the regulatory action is "significant", and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

- (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal government or communities;
- (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of the Executive Order 12866, it has been determined that this rule is a "significant regulatory action". Even though the list and thresholds rule, by itself, imposes no cost on facilities, the cost impact of the list and thresholds derives from compliance with the risk management program regulations and other reasonable regulations, which are triggered by the presence of a regulated substance above its threshold quantity. The annual effect on the economy for the accidental release prevention regulations that will be triggered by this rule is expected to exceed \$100 million. As such, this action is submitted to OMB for review as part of a larger accidental release prevention program. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

The Agency developed a draft Regulatory Impacts Analysis (RIA) for the proposed rule that considered the cost for the accidental release prevention program envisioned under section 112(r); this draft RIA includes the list and thresholds and the risk management program requirements. The list rule, by itself, imposes only very minimal costs associated with the petition requirements for additions to, and deletions from, the list and for the documentation of mixtures; the majority of costs relate to actions that facilities with listed chemicals must undertake as a result of the risk management program rule.

The requirements under the OSHA Process Safety Management Standard, which parallels the EPA risk management planning requirements, have now been in place for some time, and information is

becoming available on the costs to facilities working to comply with OSHA. An addendum to the draft RIA was developed for the proposed risk management program rule to reflect public comments and the new information. The Agency estimate of the universe of facilities covered by the final list and thresholds rule has since been revised. EPA now estimates that approximately 118,000 facilities will be covered by the final list and thresholds rule. The distribution of facilities covered includes 11,000 manufacturers and 107,000 non-manufacturers (i.e., refineries; public drinking water and waste treatment systems; cold storage facilities; wholesalers; agricultural retailers; service industry facilities; private utilities; propane retailers, propane users, explosives manufacturers, and gas extraction and processing facilities). The average number of regulated substances per facility varies from one for cold storage facilities to six for highly complex manufacturing facilities.

EPA estimates that the petition process under this rulemaking will cost a facility submitting a petition an average of \$5,000. EPA estimates that there will be 11 petitions a year. EPA anticipates that the cost to the Federal government for processing and reviewing the petitions will be approximately equal to the cost to facilities for filing a petition. The total annual cost is estimated to be \$110,000 (\$5,000 x 2 x 11 petitions).

B. Regulatory Flexibility Act

Pursuant to the *Regulatory Flexibility Act of 1980*, 5 U.S.C. 601 *et seq.*, when an agency publishes a notice of rulemaking, for a rule that will have a significant effect on a substantial number of small entities, the agency must prepare and make available for public comment a regulatory flexibility analysis that considers the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions).

The list rule, by itself, imposes only very minimal costs associated with the petition requirements for additions to, and deletions from, the list and for the documentation of mixtures; the majority of costs relate to actions that facilities with listed chemicals must undertake as a result of the risk management program rule. The risk management program regulation was proposed by EPA on October 20, 1993 (58 FR 54190); a discussion of the impacts on small entities is included on page 54212. The initial Regulatory Flexibility Analysis is contained in the combined economic analysis entitled *Regulatory Impact Analysis in Support of Listing Regulated Substances and Thresholds and Mandating Risk Management Programs for Chemical Accident Prevention, as Required by Section 112(r) of the CAA*, available in the docket. A revised economic analysis will be developed in conjunction with the final risk management program regulation.

C. Paperwork Reduction Act

The information collection requirements contained in this rule have been approved by the Office of Management and Budget (OMB) under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and have been assigned control number 2050-0127.

Public reporting for this collection of information in the petition process is estimated to be approximately 138 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. EPA estimates that there will be 11 petitions a year. The total annual burden is estimated to be 1,518 hours (138 hours x 11 petitions).

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to:

Chief, Information Policy Branch, PM-223, U.S., Environmental Protection Agency, 401 M St. S.W., Washington, D.C. 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503, marked "Attention: Desk Officer for EPA."

D. Display of OMB Control Numbers

EPA is also amending the table of currently approved information collection request (ICR) control numbers issued by OMB for various regulations. This amendment updates the table to accurately display those information requirements contained in this final rule. This display of the OMB control number and its subsequent codification in the Code of Federal Regulations satisfies the requirements of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*) and OMB's implementing regulations at 5 CFR 1320.

The ICR was previously subject to public notice and comment prior to OMB approval. As a result, EPA finds that there is "good cause" under section 553(b)(B) of the Administrative Procedure Act (5 U.S.C. 553(b)(B)) to amend this table without prior notice and comment. Due to the technical nature of the table, further notice

List of Regulated Substances and Thresholds for Accidental Release Prevention; Requirements for Petitions under Section 112(r) of the Clean Air Act as Amended Page 72 of 97

and comment would be unnecessary. For the same reasons, EPA also finds that there is good cause under 5 U.S.C. 553(d)(3).

List of Subjects

40 CFR Part 9

Environmental protection, paperwork reduction act.

40 CFR Part 68

Environmental protection, Chemicals, Chemical accident prevention, Clean Air Act, Extremely hazardous substances, Intergovernmental relations, Hazardous substances, Reporting and Recordkeeping

requirements.

Dated: January 14, 1994

Signed:

Carol M. Browner,

Administrator.

For the reasons set out in the preamble, title 40, chapter I, subchapter A, part 9 of the Code of Federal Regulations is amended, and title 40, chapter I, subchapter C, part 68 of the Code of Federal Regulations is added, as set forth below:

Part 9 - OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 et seq., 136-136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601-2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 et seq., 1311, 1313d, 1314, 1321, 1326, 1330, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971-1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-1, 300j-2, 300j-3, 300j-4, 300j-9, 1857 et seq., 6901-6992k, 7401-7671q, 7542, 9601-9657, 11023, 11048.

2. Section 9.1 is amended by adding the new entry with a new heading to the table to read as follows:

9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

40 CFR Citation OMB Control No.

* * * * *

Chemical Accident Prevention Provisions

68.120 (a), (e), and (g) 2050-0127

* * * * *

3. Part 68 is added to read as follows:

PART 68 - CHEMICAL ACCIDENT PREVENTION PROVISIONS

Subpart A - General

Sec.

68.1 Scope.

68.3 Definitions.

Subpart B - Risk Management Plan Requirements [Reserved]

Subpart C - Regulated Substances for Accidental Release Prevention

68.100 Purpose.

68.115 Threshold determination.

68.120 Petition process.

68.125 Exemptions.

68.130 List of substances.

Authority: 42 U.S.C. 7412(r), 7601.

Subpart A - General

68.1 Scope.

This Part sets forth the list of regulated substances and thresholds, the petition process for adding or deleting substances to the list of regulated substances, the requirements for owners or operators of stationary sources concerning the prevention of accidental releases, and the State accidental release prevention programs approved under section 112(r). The list of substances, threshold quantities, and accident prevention regulations promulgated under this part do not limit in any way the general duty provisions under section 112(r)(1).

68.3 Definitions.

For the purposes of this Part:

Accidental release means an unanticipated emission of a regulated substance or other extremely hazardous substance into the ambient air from a stationary source.

Administrator means the administrator of the U.S. Environmental Protection Agency.

Article means a manufactured item, as defined under 29 CFR 1910.1200(b), that is formed to a specific shape or design during manufacture, that has end use functions dependent in whole or in part upon the shape or design during end use, and that does not release or otherwise result in exposure to a regulated substance under normal conditions of processing and use.

CAS means the Chemical Abstracts Service.

DOT means the United States Department of Transportation.

Process means any activity involving a regulated substance including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities. For the purposes of this definition, any group of vessels that are interconnected, or separate vessels that are located such that a regulated substance could be involved in a potential release, shall be considered a single process.

Regulated substance is any substance listed pursuant to section 112(r)(3) of the Clean Air Act as amended, in 68.130.

Stationary source means any buildings, structures, equipment, installations, or substance emitting stationary activities which belong to the same industrial group, which are located on one or more contiguous properties, which are under the control of the same person (or persons under common control), and from which an accidental release may occur. A stationary source includes transportation containers that are no longer under active shipping papers and transportation containers that are connected to equipment at the stationary source for the purposes of temporary storage, loading, or unloading. The term stationary source does not apply to transportation, including the storage incident to transportation, of any regulated substance or any other extremely hazardous substance under the provisions of this Part, provided that such transportation is regulated under 49 CFR Parts 192, 193, or 195. Properties shall not be considered contiguous solely because of a railroad or gas pipeline right-of-way.

Threshold quantity means the quantity specified for regulated substances pursuant to section 112(r)(5) of the Clean Air Act as amended, listed in 68.130 and determined to be present at a stationary source as specified in 68.115 of this Part.

Vessel means any reactor, tank, drum, barrel, cylinder, vat, kettle, boiler, pipe, hose, or other container.

Subpart B - Risk Management Plan Requirements [Reserved]

Subpart C - Regulated Substances for Accidental Release Prevention

68.100 Purpose.

This subpart designates substances to be listed under section 112(r)(3), (4), and (5) of the Clean Air Act, as amended, identifies their threshold quantities, and establishes the requirements for petitioning to add or delete substances from the list.

68.115 Threshold determination.

(a) A threshold quantity of a regulated substance listed in 68.130 is present at a stationary source if the total quantity of the regulated substance contained in a process exceeds the threshold.

(b) For the purposes of determining whether more than a threshold quantity of a regulated substance is present at the stationary source, the following exemptions apply:

(1) *Concentrations of a regulated toxic substance in a mixture.* If a regulated substance is present in a mixture and the concentration of the substance is below one percent by weight of the mixture, the amount of the substance in the mixture need not be considered when determining whether more than a threshold quantity is present at the stationary source. Except for oleum, toluene 2,4-diisocyanate, toluene 2,6-diisocyanate, and toluene diisocyanate (unspecified isomer), if the concentration of the regulated substance in the mixture is one percent or greater by weight, but the owner or operator can demonstrate that the partial pressure of the regulated substance in the mixture (solution) under handling or storage conditions in any portion of the process is less than 10 millimeters of mercury (mm Hg), the amount of the substance in the mixture in that portion of the process need not be considered when determining whether more than a threshold quantity is present at the stationary source. The owner or operator shall document this partial pressure measurement or estimate.

(2) *Concentrations of a regulated flammable substance in a mixture.* If a regulated substance is present in a mixture and the concentration of the substance is below one percent by weight of the mixture, the mixture need not be considered when determining whether more than a threshold quantity of the regulated substance is present at the stationary source. If the concentration of the regulated substance in the mixture is one percent or greater by weight, then, for purposes of determining whether more than a threshold quantity is present at the stationary source, the entire weight of the mixture shall be treated as the regulated substance unless the owner or operator can demonstrate that the mixture itself does not meet the criteria for flammability of flash point below 73oF (22.8oC) and boiling point below 100oF (37.8oC). The owner or operator shall document these flash point and boiling point measurements or estimates.

(3) *Concentrations of a regulated explosive substance in a mixture.* Mixtures of Division 1.1 explosives listed in 49 CFR 172.101 (Hazardous Materials Table) and other explosives need not be included when

determining whether a threshold quantity is present in a process, when the mixture is intended to be used on-site in a non-accidental release in a manner consistent with applicable BATF regulations. Other mixtures of Division 1.1 explosives listed in 49 CFR 172.101 and other explosives shall be included in determining whether more than a threshold quantity is present in a process if such mixtures would be treated as Division 1.1 explosives under 49 CFR Parts 172 and 173.

(4) *Articles*. Regulated substances contained in articles need not be considered when determining whether more than a threshold quantity is present at the stationary source.

(5) *Uses*. Regulated substances, when in use for the following purposes, need not be included in determining whether more than a threshold quantity is present at the stationary source:

(i) Use as a structural component of the stationary source;

(ii) Use of products for routine janitorial maintenance;

(iii) Use by employees of foods, drugs, cosmetics, or other personal items containing the regulated substance; and

(iv) Use of regulated substances present in process water or non-contact cooling water as drawn from the environment or municipal sources, or use of regulated substances present in air used either as compressed air or as part of combustion.

(6) *Activities in Laboratories*. If a regulated substance is manufactured, processed, or used in a laboratory at a stationary source under the supervision of a technically qualified individual as defined in 720.3(ee) of this chapter, the quantity of the substance need not be considered in determining whether a threshold quantity is present. This exemption does not apply to:

(i) Specialty chemical production;

(ii) Manufacture, processing, or use of substances in pilot plant scale operations; and

(iii) Activities conducted outside the laboratory.

68.120 Petition process.

(a) Any person may petition the Administrator to modify, by addition or deletion, the list of regulated substances identified in 68.130. Based on the information presented by the petitioner, the Administrator may grant or deny a petition.

(b) A substance may be added to the list if, in the case of an accidental release, it is known to cause or

may be reasonably anticipated to cause death, injury, or serious adverse effects to human health or the environment.

(c) A substance may be deleted from the list if adequate data on the health and environmental effects of the substance are available to determine that the substance, in the case of an accidental release, is not known to cause and may not be reasonably anticipated to cause death, injury, or serious adverse effects to human health or the environment.

(d) No substance for which a national primary ambient air quality standard has been established shall be added to the list. No substance regulated under Title VI of the Clean Air Act, as amended, shall be added to the list.

(e) The burden of proof is on the petitioner to demonstrate that the criteria for addition and deletion are met. A petition will be denied if this demonstration is not made.

(f) The Administrator will not accept additional petitions on the same substance following publication of a final notice of the decision to grant or deny a petition, unless new data becomes available that could significantly affect the basis for the decision.

(g) Petitions to modify the list of regulated substances must contain the following:

(1) Name and address of the petitioner and a brief description of the organization(s) that the petitioner represents, if applicable;

(2) Name, address, and telephone number of a contact person for the petition;

(3) Common chemical name(s), common synonym(s), Chemical Abstracts Service number, and chemical formula and structure;

(4) Action requested (add or delete a substance);

(5) Rationale supporting the petitioner's position; that is, how the substance meets the criteria for addition and deletion. A short summary of the rationale must be submitted along with a more detailed narrative; and

(6) Supporting data; that is, the petition must include sufficient information to scientifically support the request to modify the list. Such information shall include:

(i) A list of all support documents;

(ii) Documentation of literature searches conducted, including, but not limited to, identification of the

database(s) searched, the search strategy, dates covered, and printed results;

(iii) Effects data (animal, human, and environmental test data) indicating the potential for death, injury, or serious adverse human and environmental impacts from acute exposure following an accidental release; printed copies of the data sources, in English, should be provided; and

(iv) Exposure data or previous accident history data, indicating the potential for serious adverse human health or environmental effects from an accidental release. These data may include, but are not limited to, physical and chemical properties of the substance, such as vapor pressure; modeling results, including data and assumptions used and model documentation; and historical accident data, citing data sources.

(h) Within 18 months of receipt of a petition, the Administrator shall publish in the Federal Register a notice either denying the petition or granting the petition and proposing a listing.

68.125 Exemptions.

Agricultural nutrients. Ammonia used as an agricultural nutrient, when held by farmers, is exempt from all provisions of this part.

68.130 List of substances.

(a) Explosives listed by DOT as Division 1.1 in 49 CFR Part 172.101 are covered under section 112(r) of the Clean Air Act. The threshold quantity for explosives is 5,000 pounds.

(b) Regulated toxic and flammable substances under section 112(r) of the Clean Air Act are the substances listed in Tables 1, 2, 3, and 4. Threshold quantities for listed toxic and flammable substances are specified in the tables.

(c) The basis for placing toxic and flammable substances on the list of regulated substances are explained in the notes to the list.

**TABLE 1 TO 68.130 - LIST OF REGULATED TOXIC SUBSTANCES AND THRESHOLD
QUANTITIES FOR ACCIDENTAL RELEASE PREVENTION
[ALPHABETICAL ORDER - 77 SUBSTANCES]**

Basis	Threshold
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Chemical Name Listing	CAS No	Quantity (lbs)	for
Acrolein [2-Propenal]	107-02-8	5,000	b
Acrylonitrile [2-Propenenitrile]	107-13-1	20,000	b
Acrylyl chloride [2-Propenoyl chloride]	814-68-6	5,000	b
Allyl alcohol [2-Propen-1-ol]	107-18-6	15,000	b
Allylamine [2-Propen-1-amine]	107-11-9	10,000	b
Ammonia (anhydrous) b	7664-41-7	10,000	a, b
Ammonia (conc 20% or greater) b	7664-41-7	20,000	a, b
Arsenous trichloride	7784-34-1	15,000	b
Arsine	7784-42-1	1,000	b
Boron trichloride [Borane, trichloro-]	10294-34-5	5,000	b
Boron trifluoride [Borane, trifluoro-]	7637-07-2	5,000	b
Boron trifluoride compound with methyl ether (1:1) [Boron, trifluoro[oxybis[metane]]-, T-4-	353-42-4	15,000	b
Bromine b	7726-95-6	10,000	a, b
Carbon disulfide	75-15-0	20,000	b
Chlorine b	7782-50-5	2,500	a, b
Chlorine dioxide [Chlorine oxide	10049-04-4	1,000	c

(C102)]

Chloroform [Methane, trichloro-]	67-66-3	20,000	b
Chloromethyl ether [Methane, oxybis[chloro-]	542-88-1	1,000	b
Chloromethyl methyl ether [Methane, chloromethoxy-]	107-30-2	5,000	b
Crotonaldehyde [2-Butenal]	4170-30-3	20,000	b
Crotonaldehyde, (E)- [2-Butenal, (E)-]	123-73-9	20,000	b
Cyanogen chloride	506-77-4	10,000	c
Cyclohexylamine [Cyclohexanamine]	108-91-8	15,000	b
Diborane	19287-45-7	2,500	b
Dimethyldichlorosilane [Silane, dichlorodimethyl-]	75-78-5	5,000	b
1,1-Dimethylhydrazine [Hydrazine, 1,1-dimethyl-]	57-14-7	15,000	b
Epichlorohydrin [Oxirane, (chloromethyl)-]	106-89-8	20,000	b
Ethylenediamine [1,2-Ethanediamine]	107-15-3	20,000	b
Ethyleneimine [Aziridine]	151-56-4	10,000	b
Ethylene oxide [Oxirane]	75-21-8	10,000	a, b
Fluorine	7782-41-4	1,000	b
Formaldehyde (solution)	50-00-0	15,000	b

Furan	110-00-9	5,000	b
Hydrazine	302-01-2	15,000	b
Hydrochloric acid (conc 30% or greater)	7647-01-0	15,000	d
Hydrocyanic acid b	74-90-8	2,500	a,
Hydrogen chloride (anhydrous) [Hydrochloric acid]	7647-01-0	5,000	a
Hydrogen fluoride/Hydrofluoric acid b (conc 50% or greater) [Hydrofluoric acid]	7664-39-3	1,000	a,
Hydrogen selenide	7783-07-5	500	b
Hydrogen sulfide b	7783-06-4	10,000	a,
Iron, pentacarbonyl- [Iron carbonyl (Fe(CO) ₅), (TB-5-11)-]	13463-40-6	2,500	b
Isobutyronitrile [Propanenitrile, 2-methyl-]	78-82-0	20,000	b
Isopropyl chloroformate [Carbonochloridic acid, 1-methylethyl ester]	108-23-6	15,000	b
Methacrylonitrile [2-Propenenitrile, 2-methyl-]	126-98-7	10,000	b
Methyl chloride [Methane, chloro-]	74-87-3	10,000	a
Methyl chloroformate [Carbonochloridic acid, methylester]	79-22-1	5,000	b
Methyl hydrazine [Hydrazine, methyl-]	60-34-4	15,000	b

Methyl isocyanate [Methane, b isocyanato-]	624-83-9	10,000	a,
Methyl mercaptan [Methanethiol]	74-93-1	10,000	b
Methyl thiocyanate [Thiocyanic acid, methyl ester]	556-64-9	20,000	b
Methyltrichlorosilane [Silane, trichloromethyl-]	75-79-6	5,000	b
Nickel carbonyl	13463-39-3	1,000	b
Nitric acid (conc 80% or greater)	7697-37-2	15,000	b
Nitric oxide [Nitrogen oxide (NO)]	10102-43-9	10,000	b
Oleum (Fuming Sulfuric acid) [Sulfuric acid, mixture with sulfur trioxide]1	8014-95-7	10,000	e
Peracetic acid [Ethaneperoxoic acid]	79-21-0	10,000	b
Perchloromethylmercaptan [Methanesulphenyl chloride, trichloro-]	594-42-3	10,000	b
Phosgene [Carbonic dichloride] b	75-44-5	500	a,
Phosphine	7803-51-2	5,000	b
Phosphorus oxychloride [Phosphoryl chloride]	10025-87-3	5,000	b
Phosphorus trichloride [Phosphorous trichloride]	7719-12-2	15,000	b
Piperidine	110-89-4	15,000	b
Propionitrile [Propanenitrile]	107-12-0	10,000	b

Propyl chloroformate [Carbonochloridic acid, propylester]	109-61-5	15,000	b
Propyleneimine [Aziridine, 2-methyl-]	75-55-8	10,000	b
Propylene oxide [Oxirane, methyl-]	75-56-9	10,000	b
Sulfur dioxide (anhydrous)	7446-09-5	5,000	a, b
Sulfur tetrafluoride [Sulfur fluoride (SF4), (T-4)-]	7783-60-0	2,500	b
Sulfur trioxide	7446-11-9	10,000	a, b
Tetramethyllead [Plumbane, tetramethyl-]	75-74-1	10,000	b
Tetranitromethane [Methane, tetranitro-]	509-14-8	10,000	b
Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-]	7550-45-0	2,500	b
Toluene 2,4-diisocyanate [Benzene, 2,4-diisocyanato-1-methyl-]1	584-84-9	10,000	a
Toluene 2,6-diisocyanate [Benzene, 1,3-diisocyanato-2-methyl-]1	91-08-7	10,000	a
Toluene diisocyanate (unspecified isomer) [Benzene, 1,3-diisocyanatomethyl-]1	26471-62-5	10,000	a
Trimethylchlorosilane [Silane, chlorotrimethyl-]	75-77-4	10,000	b
Vinyl acetate monomer [Acetic acid ethenyl ester]	108-05-4	15,000	b

1The mixture exemption in 68.115(b)(1) does not apply to the

substance.

Basis for Listing:

aMandated for listing by Congress.

bOn EHS list, vapor pressure 10 mmHg or greater.

cToxic gas.

dToxicity of hydrogen chloride, potential to release hydrogen chloride,

and history of accidents.

eToxicity of sulfur trioxide and sulfuric acid, potential to release sulfur trioxide, and history of accidents.

**TABLE 2 TO 68.130 - LIST OF REGULATED TOXIC SUBSTANCES AND THRESHOLD
QUANTITIES FOR ACCIDENTAL RELEASE PREVENTION
[CAS NUMBER ORDER - 77 SUBSTANCES]**

Basis CAS No. Listing	Chemical Name	Threshold	
		Quantity (lbs)	for
50-00-0	Formaldehyde (solution)	15,000	b
57-14-7	1,1-Dimethylhydrazine [Hydrazine, 1,1-dimethyl-]	15,000	b
60-34-4	Methyl hydrazine [Hydrazine, methyl-]	15,000	b
67-66-3	Chloroform [Methane, trichloro-]	20,000	b

	74-87-3	Methyl chloride [Methane, chloro-]	10,000	a
b	74-90-8	Hydrocyanic acid	2,500	a,
	74-93-1	Methyl mercaptan [Methanethiol]	10,000	b
	75-15-0	Carbon disulfide	20,000	b
b	75-21-8	Ethylene oxide [Oxirane]	10,000	a,
b	75-44-5	Phosgene [Carbonic dichloride]	500	a,
	75-55-8	Propyleneimine [Aziridine, 2-methyl-]	10,000	b
	75-56-9	Propylene oxide [Oxirane, methyl-]	10,000	b
	75-74-1	Tetramethyllead [Plumbane, tetramethyl-]	10,000	b
	75-77-4	Trimethylchlorosilane [Silane, chlorotrimethyl-]	10,000	b
	75-78-5	Dimethyldichlorosilane [Silane, dichlorodimethyl-]	5,000	b
	75-79-6	Methyltrichlorosilane [Silane, trichloromethyl-]	5,000	b
	78-82-0	Isobutyronitrile [Propanenitrile, 2-methyl-]	20,000	b
	79-21-0	Peracetic acid [Ethaneperoxoic acid]	10,000	b
	79-22-1	Methyl chloroformate [Carbonochloridic acid, methylester]	5,000	b
	91-08-7	Toluene 2,6-diisocyanate [Benzene, 1,3-diisocyanato-2-methyl-]1	10,000	a

106-89-8	Epichlorohydrin [Oxirane, (chloromethyl)-]	20,000	b
107-02-8	Acrolein [2-Propenal]	5,000	b
107-11-9	Allylamine [2-Propen-1-amine]	10,000	b
107-12-0	Propionitrile [Propanenitrile]	10,000	b
107-13-1	Acrylonitrile [2-Propenenitrile]	20,000	b
107-15-3	Ethylenediamine [1,2-Ethanediamine]	20,000	b
107-18-6	Allyl alcohol [2-Propen-1-ol]	15,000	b
107-30-2	Chloromethyl methyl ether [Methane, chloromethoxy-]	5,000	b
108-05-4	Vinyl acetate monomer [Acetic acid ethenyl ester]	15,000	b
108-23-6	Isopropyl chloroformate [Carbonochloridic acid, 1-methylethyl ester]	15,000	b
108-91-8	Cyclohexylamine [Cyclohexanamine]	15,000	b
109-61-5	Propyl chloroformate [Carbonochloridic acid, propylester]	15,000	b
110-00-9	Furan	5,000	b
110-89-4	Piperidine	15,000	b
123-73-9	Crotonaldehyde, (E)- [2-Butenal, (E)-]	20,000	b
126-98-7	Methacrylonitrile [2-Propenenitrile, 2-methyl-]	10,000	b
151-56-4	Ethyleneimine [Aziridine]	10,000	b
302-01-2	Hydrazine	15,000	b

353-42-4	Boron trifluoride compound with methyl ether (1:1) [Boron, trifluoro[oxybis[metane]]-, T-4-	15,000	b
506-77-4	Cyanogen chloride	10,000	c
509-14-8	Tetranitromethane [Methane, tetranitro-]	10,000	b
542-88-1	Chloromethyl ether [Methane, oxybis[chloro-]	1,000	b
556-64-9	Methyl thiocyanate [Thiocyanic acid, methyl ester]	20,000	b
584-84-9	Toluene 2,4-diisocyanate [Benzene, 2,4-diisocyanato-1-methyl-]1	10,000	a
594-42-3	Perchloromethylmercaptan [Methanesulfenyl chloride, trichloro-]	10,000	b
624-83-9	Methyl isocyanate [Methane, isocyanato-]	10,000	a,
814-68-6	Acrylyl chloride [2-Propenoyl chloride]	5,000	b
4170-30-3	Crotonaldehyde [2-Butenal]	20,000	b
7446-09-5	Sulfur dioxide (anhydrous)	5,000	a,
7446-11-9	Sulfur trioxide	10,000	a,
7550-45-0	Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-]	2,500	b
7637-07-2	Boron trifluoride [Borane, trifluoro-]	5,000	b

	7647-01-0	Hydrochloric acid (conc 30% or greater)	15,000	d
	7647-01-0	Hydrogen chloride (anhydrous) [Hydrochloric acid]	5,000	a
b	7664-39-3	Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater) [Hydrofluoric acid]	1,000	a,
b	7664-41-7	Ammonia (anhydrous)	10,000	a,
b	7664-41-7	Ammonia (conc 20% or greater)	20,000	a,
	7697-37-2	Nitric acid (conc 80% or greater)	15,000	b
	7719-12-2	Phosphorus trichloride [Phosphorous trichloride]	15,000	b
b	7726-95-6	Bromine	10,000	a,
	7782-41-4	Fluorine	1,000	b
b	7782-50-5	Chlorine	2,500	a,
b	7783-06-4	Hydrogen sulfide	10,000	a,
	7783-07-5	Hydrogen selenide	500	b
	7783-60-0	Sulfur tetrafluoride [Sulfur fluoride (SF4), (T-4)-]	2,500	b
	7784-34-1	Arsenous trichloride	15,000	b
	7784-42-1	Arsine	1,000	b

7803-51-2	Phosphine	5,000	b
8014-95-7	Oleum (Fuming Sulfuric acid) [Sulfuric acid, mixture with sulfur trioxide]1	10,000	e
10025-87-3	Phosphorus oxychloride [Phosphoryl chloride]	5,000	b
10049-04-4	Chlorine dioxide [Chlorine oxide (ClO ₂)]	1,000	c
10102-43-9	Nitric oxide [Nitrogen oxide (NO)]	10,000	b
10294-34-5	Boron trichloride [Borane, trichloro-]	5,000	b
13463-39-3	Nickel carbonyl	1,000	b
13463-40-6	Iron, pentacarbonyl- [Iron carbonyl (Fe(CO) ₅), (TB-5-11)-]	2,500	b
19287-45-7	Diborane	2,500	b
26471-62-5	Toluene diisocyanate (unspecified isomer) [Benzene, 1,3-diisocyanatomethyl-]1	10,000	a

1The mixture exemption in 68.115(b)(1) does not apply to the substance.

Basis for Listing:

aMandated for listing by Congress.

bOn EHS list, vapor pressure 10 mmHg or greater.

cToxic gas.

dToxicity of hydrogen chloride, potential to release hydrogen chloride,

and history of accidents.

eToxicity of sulfur trioxide and sulfuric acid, potential to release sulfur trioxide, and history of accidents.

**TABLE 3 TO 68.130 - LIST OF REGULATED FLAMMABLE SUBSTANCES AND
THRESHOLD QUANTITIES FOR ACCIDENTAL RELEASE PREVENTION
[ALPHABETICAL ORDER - 63 SUBSTANCES]**

Basis		Threshold	
Chemical Name Listing	CAS No.	Quantity (lbs)	for
Acetaldehyde	75-07-0	10,000	g
Acetylene [Ethyne]	74-86-2	10,000	f
Bromotrifluorethylene [Ethene, bromotrifluoro-]	598-73-2	10,000	f
1,3-Butadiene	106-99-0	10,000	f
Butane	106-97-8	10,000	f
1-Butene	106-98-9	10,000	f
2-Butene	107-01-7	10,000	f
Butene	25167-67-3	10,000	f
2-Butene-cis	590-18-1	10,000	f
2-Butene-trans [2-Butene, (E)]	624-64-6	10,000	f
Carbon oxysulfide [Carbon oxide sulfide (COS)]	463-58-1	10,000	f
Chlorine monoxide [Chlorine oxide]	7791-21-1	10,000	f
2-Chloropropylene [1-Propene,	557-98-2	10,000	g

2-chloro-]

1-Chloropropylene [1-Propene, 1-chloro-]	590-21-6	10,000	g
Cyanogen [Ethanedinitrile]	460-19-5	10,000	f
Cyclopropane	75-19-4	10,000	f
Dichlorosilane [Silane, dichloro-]	4109-96-0	10,000	f
Difluoroethane [Ethane, 1,1-difluoro-]	75-37-6	10,000	f
Dimethylamine [Methanamine, N-methyl-]	124-40-3	10,000	f
2,2-Dimethylpropane [Propane, 2,2-dimethyl-]	463-82-1	10,000	f
Ethane	74-84-0	10,000	f
Ethyl acetylene [1-Butyne]	107-00-6	10,000	f
Ethylamine [Ethanamine]	75-04-7	10,000	f
Ethyl chloride [Ethane, chloro-]	75-00-3	10,000	f
Ethylene [Ethene]	74-85-1	10,000	f
Ethyl ether [Ethane, 1,1'-oxybis-]	60-29-7	10,000	g
Ethyl mercaptan [Ethanethiol]	75-08-1	10,000	g
Ethyl nitrite [Nitrous acid, ethyl ester]	109-95-5	10,000	f
Hydrogen	1333-74-0	10,000	f
Isobutane [Propane, 2-methyl]	75-28-5	10,000	f
Isopentane [Butane, 2-methyl-]	78-78-4	10,000	g
Isoprene [1,3-Butadiene, 2-methyl-]	78-79-5	10,000	g

Isopropylamine [2-Propanamine]	75-31-0	10,000	g
Isopropyl chloride [Propane, 2-chloro-]	75-29-6	10,000	g
Methane	74-82-8	10,000	f
Methylamine [Methanamine]	74-89-5	10,000	f
3-Methyl-1-butene	563-45-1	10,000	f
2-Methyl-1-butene	563-46-2	10,000	g
Methyl ether [Methane, oxybis-]	115-10-6	10,000	f
Methyl formate [Formic acid, methyl ester]	107-31-3	10,000	g
2-Methylpropene [1-Propene, 2-methyl-]	115-11-7	10,000	f
1,3-Pentadiene	504-60-9	10,000	f
Pentane	109-66-0	10,000	g
1-Pentene	109-67-1	10,000	g
2-Pentene, (E)-	646-04-8	10,000	g
2-Pentene, (Z)-	627-20-3	10,000	g
Propadiene [1,2-Propadiene]	463-49-0	10,000	f
Propane	74-98-6	10,000	f
Propylene [1-Propene]	115-07-1	10,000	f
Propyne [1-Propyne]	74-99-7	10,000	f
Silane	7803-62-5	10,000	f
Tetrafluoroethylene [Ethene, tetrafluoro-]	116-14-3	10,000	f

Tetramethylsilane [Silane, tetramethyl-]	75-76-3	10,000	g
Trichlorosilane [Silane, trichloro-]	10025-78-2	10,000	g
Trifluorochloroethylene [Ethene, chlorotrifluoro-]	79-38-9	10,000	f
Trimethylamine [Methanamine, N,N-dimethyl-]	75-50-3	10,000	f
Vinyl acetylene [1-Buten-3-yne]	689-97-4	10,000	f
Vinyl chloride [Ethene, chloro-]	75-01-4	10,000	a, f
Vinyl ethyl ether [Ethene, ethoxy-]	109-92-2	10,000	g
Vinyl fluoride [Ethene, fluoro-]	75-02-5	10,000	f
Vinylidene chloride [Ethene, 1,1-dichloro-]	75-35-4	10,000	g
Vinylidene fluoride [Ethene, 1,1-difluoro-]	75-38-7	10,000	f
Vinyl methyl ether [Ethene, methoxy-]	107-25-5	10,000	f

Basis for Listing:

aMandated for listing by Congress.

fFlammable gas.

gVolatile flammable liquid.

**TABLE 4 TO 68.130 - LIST OF REGULATED FLAMMABLE SUBSTANCES AND
THRESHOLD QUANTITIES FOR ACCIDENTAL RELEASE PREVENTION
[CAS NUMBER ORDER - 63 SUBSTANCES]**

Basis			Threshold	
CAS No. Listing	Chemical Name	CAS No.	Quantity (lbs)	for
60-29-7	Ethyl ether [Ethane, 1,1'-oxybis-]	60-29-7	10,000	g
74-82-8	Methane	74-82-8	10,000	f
74-84-0	Ethane	74-84-0	10,000	f
74-85-1	Ethylene [Ethene]	74-85-1	10,000	f
74-86-2	Acetylene [Ethyne]	74-86-2	10,000	f
74-89-5	Methylamine [Methanamine]	74-89-5	10,000	f
74-98-6	Propane	74-98-6	10,000	f
74-99-7	Propyne [1-Propyne]	74-99-7	10,000	f
75-00-3	Ethyl chloride [Ethane, chloro-]	75-00-3	10,000	f
75-01-4	Vinyl chloride [Ethene, chloro-]	75-01-4	10,000	a, f
75-02-5	Vinyl fluoride [Ethene, fluoro-]	75-02-5	10,000	f
75-04-7	Ethylamine [Ethanamine]	75-04-7	10,000	f
75-07-0	Acetaldehyde	75-07-0	10,000	g
75-08-1	Ethyl mercaptan [Ethanethiol]	75-08-1	10,000	g

75-19-4	Cyclopropane	75-19-4	10,000	f
75-28-5	Isobutane [Propane, 2-methyl]	75-28-5	10,000	f
75-29-6	Isopropyl chloride [Propane, 2-chloro-]	75-29-6	10,000	g
75-31-0	Isopropylamine [2-Propanamine]	75-31-0	10,000	g
75-35-4	Vinylidene chloride [Ethene, 1,1-dichloro-]	75-35-4	10,000	g
75-37-6	Difluoroethane [Ethane, 1,1-difluoro-]	75-37-6	10,000	f
75-38-7	Vinylidene fluoride [Ethene, 1,1-difluoro-]	75-38-7	10,000	f
75-50-3	Trimethylamine [Methanamine, N,N-dimethyl-]	75-50-3	10,000	f
75-76-3	Tetramethylsilane [Silane, tetramethyl-]	75-76-3	10,000	g
78-78-4	Isopentane [Butane, 2-methyl-]	78-78-4	10,000	g
78-79-5	Isoprene [1,3-Butadiene, 2-methyl-]	78-79-5	10,000	g
79-38-9	Trifluorochloroethylene [Ethene, chlorotrifluoro-]	79-38-9	10,000	f
106-97-8	Butane	106-97-8	10,000	f
106-98-9	1-Butene	106-98-9	10,000	f
106-99-0	1,3-Butadiene	106-99-0	10,000	f

107-00-6	Ethyl acetylene [1-Butyne]	107-00-6	10,000	f
107-01-7	2-Butene	107-01-7	10,000	f
107-25-5	Vinyl methyl ether [Ethene, methoxy-]	107-25-5	10,000	f
107-31-3	Methyl formate [Formic acid, methyl ester]	107-31-3	10,000	g
109-66-0	Pentane	109-66-0	10,000	g
109-67-1	1-Pentene	109-67-1	10,000	g
109-92-2	Vinyl ethyl ether [Ethene, ethoxy-]	109-92-2	10,000	g
109-95-5	Ethyl nitrite [Nitrous acid, ethyl ester]	109-95-5	10,000	f
115-07-1	Propylene [1-Propene]	115-07-1	10,000	f
115-10-6	Methyl ether [Methane, oxybis-]	115-10-6	10,000	f
115-11-7	2-Methylpropene [1-Propene, 2-methyl-]	115-11-7	10,000	f
116-14-3	Tetrafluoroethylene [Ethene, tetrafluoro-]	116-14-3	10,000	f
124-40-3	Dimethylamine [Methanamine, N-methyl-]	124-40-3	10,000	f
460-19-5	Cyanogen [Ethanedinitrile]	460-19-5	10,000	f
463-49-0	Propadiene [1,2-Propadiene]	463-49-0	10,000	f
463-58-1	Carbon oxysulfide [Carbon oxide sulfide (COS)]	463-58-1	10,000	f
463-82-1	2,2-Dimethylpropane	463-82-1	10,000	f

[Propane, 2,2-dimethyl-]

504-60-9	1,3-Pentadiene	504-60-9	10,000	f
557-98-2	2-Chloropropylene [1-Propene, 2-chloro-]	557-98-2	10,000	g
563-45-1	3-Methyl-1-butene	563-45-1	10,000	f
563-46-2	2-Methyl-1-butene	563-46-2	10,000	g
590-18-1	2-Butene-cis	590-18-1	10,000	f
590-21-6	1-Chloropropylene [1-Propene, 1-chloro-]	590-21-6	10,000	g
598-73-2	Bromotrifluorethylene [Ethene, bromotrifluoro-]	598-73-2	10,000	f
624-64-6	2-Butene-trans [2-Butene, (E)]	624-64-6	10,000	f
627-20-3	2-Pentene, (Z)-	627-20-3	10,000	g
646-04-8	2-Pentene, (E)-	646-04-8	10,000	g
689-97-4	Vinyl acetylene [1-Buten-3-yne]	689-97-4	10,000	f
1333-74-0	Hydrogen	1333-74-0	10,000	f
4109-96-0	Dichlorosilane [Silane, dichloro-]	4109-96-0	10,000	f
7791-21-1	Chlorine monoxide [Chlorine oxide]	7791-21-1	10,000	f
7803-62-5	Silane	7803-62-5	10,000	f
10025-78-2	Trichlorosilane [Silane, trichloro-]	10025-78-2	10,000	g
25167-67-3	Butene	25167-67-3	10,000	f

aMandated for listing by Congress.

fFlammable gas.

gVolatile flammable liquid.