1200 Emergency Prevention and Response

1201 Accidental Release Prevention Regulation

1.0 Statement of Authority

1.1 Pursuant to 7 **Delaware Code,** Chapter 77, the General Assembly of the State of Delaware has directed that regulations be prepared and adopted by the Department of Natural Resources and Environmental Control to require owners or operators of stationary sources having regulated substances to take actions, subject to review by the Department, to control and minimize the chances of sudden, accidental releases and catastrophic releases of such substances. The Department adopted the "Regulation for the Management of Extremely Hazardous Substances" on September 25, 1989 and modified this regulation on December 18, 1995. The "Accidental Release Prevention Regulation" replaces the "Regulation for the Management of Extremely Hazardous Substances" in its entirety.

1.2 The General Assembly of the State of Delaware has also directed the Department to seek full delegation from the United States Environmental Protection Agency to administer the sections of 40 Code of Federal Regulations (CFR) Part 68, "Chemical Accident Provisions" revised as of July 1, 1997 which can be delegated to the State.

2.0 Purpose

2.1 The purpose of this regulation is to protect lives and the health of citizens of the state living and working in the vicinity of stationary sources having regulated substances on site. This regulation is concerned with the prevention of sudden releases of regulated substances and the generation of pressure waves and thermal exposure beyond the property boundaries of the stationary source where they occur and the catastrophic health consequences caused by short-term exposures to such accidental releases. This regulation has the goal of prevention of such catastrophic events by requiring owner or operator having regulated substances on-site to take all feasible actions needed to minimize the probability of catastrophic events. It is the intent of this regulation to complement and be enforced in conjunction with other laws.

2.2 It is also the secondary purpose of this regulation to adopt the necessary language to allow the Department to seek delegation of the United States Environmental Protection Agency authority for 40 CFR Part 68, "Chemical Accident Provisions" revised as of April 9, 2004 for the administration of the sections of this rule which can be delegated to the State.

2.3 This regulation has two parts. The first part (consisting of Section 5) deals with adopting the federal language to allow delegation of the federal program. The second part (consisting of Section 6) uses state authority to extend beyond 40 CFR Part 68 to continue to regulate substances that were previously regulated by the Delaware "Regulation for the Management of Extremely Hazardous Substances", as revised on December 18, 1995. The accidental release prevention activities (the prevention program or the risk management program) are the same for processes subject to either Section 5.0 or Section 6.0. Section 6.0 also contains reporting requirements for a process having regulated substances that are subject to the State criteria but not the federal criteria.

3.0 Policy and General Duty

3.1 It is the obligation of the owner or operator of stationary sources having regulated substances on-site to operate in a manner consistent with this regulation by developing and implementing a risk management program that anticipates and minimizes the chances of catastrophic

events. The stationary source risk management program implementation shall be subject to review by the Department. It is the objective of this regulation and the programs established by this regulation to prevent accidental releases and to minimize the consequences of any such release of any substance listed in Section 5.130 or Sections 6.2, 6.3 and 6.4 or any other extremely hazardous substance.

3.2 Every person in control of or associated with any such substances (regulated or not regulated) that is produced, handled, or stored has a general duty to identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

4.0 Definitions

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

Actual Distance to Stationary Source Boundary means the distance from the nearest potential release point capable of generating a sufficient quantity to the nearest public receptor.

Actual Quantity (AQ) means the sum of all the physical quantities of a regulated substance listed in either Section 6.2, 6.3 or 6.4 in whatever form at the maximum design capacity of the process considering administrative controls.

Administrative controls mean written procedural mechanisms used for hazard control.

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

AIChE/CCPS means the American Institute of Chemical Engineers/Center for Chemical Process Safety.

API means the American Petroleum Institute.

Article means a manufactured item, as defined under 29 CFR 1910.1200(b) dated July 1, 1997, 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.

Artificial Barricade means an artificial mound or riveted wall of earth of a minimum thickness of three feet (NFPA-495, 1996 Edition, Explanatory Notes for Table 6-4.1 “American Table of Distances”).

ASME means the American Society of Mechanical Engineers.

Board means the Environmental Appeals Board.

CAS means the Chemical Abstracts Service.

Catastrophic Event means a sudden release of a sufficient quantity of a regulated substance, a pressure wave or a thermal exposure beyond the property boundaries of a stationary source which will cause death or permanent disability to a person because of a single, short term exposure.

Catastrophic release means a major uncontrolled emission, fire, or explosion, involving one or more regulated substances that presents imminent and substantial endangerment to public health and the environment.

Classified information means "classified information" as defined in the Classified Information Procedures Act, 18 U.S.C. App. 3, Section 1(a) as "any information or material that has been determined by the United States Government pursuant to an executive order, statute, or regulation, to require protection against unauthorized disclosure for reasons of national security."

Combustible Liquid means a liquid having a flash point at or above 100×F and below 140×F.

Condensate means hydrocarbon liquid separated from natural gas that condenses due to changes in temperature, pressure, or both, and remains a liquid at standard conditions.

Consequence Analysis means a review of the potential effects of regulated substance release on surrounding populations.

Consequence Assessment means an evaluation of the results of a release of a regulated substance. A consequence assessment shall consist of:

An estimate of the PRQ,

Dispersion analysis (for toxics, flammables, and combustibles) showing downwind effects, and

Consequence analysis involving potentially exposed population.

Covered process means a process that has a regulated substance present in more than a threshold quantity as determined in Section 5.115 or a regulated substance present in more than the sufficient quantity as determined in Sections 6.2, 6.3 or 6.4.

Critical means those elements such as equipment, piping, alarms, interlocks, or controls which are essential to preventing the occurrence of a catastrophic event.

Crude oil means any naturally occurring, unrefined petroleum liquid.

Department means the Department of Natural Resources and Environmental Control (DNREC).

Dispersion Analysis means the calculation, by means of a model of the ambient concentrations of a regulated substance after its release, taking into account, when appropriate, the physical and chemical state and properties of the regulated substance, the release scenario, and the geographical, topographical, geological and meteorological characteristics of the environment which will influence the migration, movement, dilution, or degradation of the regulated substance in the environment.

DOT means the United States Department of Transportation.

Environmental receptor means natural areas such as national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas; and Federal wilderness areas, that could be exposed at any time to toxic concentrations, radiant heat, or overpressure greater than or equal to the endpoints provided in Section 5.22.1, as a result of an accidental release and that can be identified on local U. S. Geological Survey maps.

Field gas means gas extracted from a production well before the gas enters a natural gas processing plant.

Flammable Gas means a gas or vapor which when mixed with air or oxygen in certain concentrations will ignite and burn on contact with a source of ignition. Such gases have lower and upper explosive limits which are usually expressed in terms of percentage by volume of gas or vapor in air.

Flammable Liquid means a liquid having a flash point below 100×F.

Hot work means work involving electric or gas welding, cutting, brazing, or similar flame or spark-producing operations.

Implementing agency means the Department.

Injury means any effect on a human that results either from direct exposure to toxic concentrations, radiant heat, or overpressures from accidental releases or from the direct consequences of a vapor cloud explosion (such as flying glass, debris, and other projectiles) from an accidental release and that requires medical treatment or hospitalization.

Major change means introduction of a new process, process equipment, or regulated substance, an alteration of process chemistry that results in any change to safe operating limits, or other alteration that introduces a new hazard.

Mechanical integrity means the process of ensuring that process equipment is fabricated from the proper materials of construction and is properly installed, maintained, and replaced to prevent failures and accidental releases.

Medical treatment means treatment, other than first aid, administered by a physician or registered professional personnel under standing orders from a physician.

Mitigation or mitigation system means specific activities, technologies, or equipment designed or deployed to capture or control substances upon loss of containment to minimize exposure of the public or the environment. Passive mitigation means equipment, devices, or technologies that function without human, mechanical, or other energy input. Active mitigation means equipment, devices, or technologies that need human, mechanical, or other energy input to function.

Natural Barricade means natural features of the ground, such as hills, or standing timber of sufficient density that the surroundings which require protection cannot be seen from the regulated process when the trees are bare of leaves; see the Explanatory Notes for Table 6-4.1 of NFPA 495 “Explosive Materials Code, 1196 Edition”.

NAICS means the North American Industrial Classification System. (Replaces SIC codes).

Natural gas processing plant (gas plant) means any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both, classified as North American Industrial Classification System (NAICS) code 211112 (previously Standard Industrial Classification (SIC) code 1321).

NFPA means the National Fire Protection Association.

Offsite means areas beyond the property boundary of the stationary source, and areas within the property boundary to which the public has routine and unrestricted access during or outside business hours.

OSHA means the U.S. Occupational Safety and Health Administration.

Owner or operator means any person who owns, leases, operates, controls, or supervises a stationary source.

Person or persons means a natural person, partnership, limited partnership, trust, estate, corporation, custodian, association or any other individual entity in its own or any representative capacity.

Petroleum refining process unit means a process unit used in an establishment primarily engaged in petroleum refining as defined in NAICS code 32411 for petroleum refining (formerly SIC code 2911) and used for the following: producing transportation fuels (such as gasoline, diesel fuels, and jet fuels), heating fuels (such as kerosene, fuel gas distillate, and fuel oils), or lubricants; separating petroleum; or separating, cracking, reacting, or reforming intermediate petroleum products streams. Examples of such units include, but are not limited to, petroleum-based solvent units, alkylation units, catalytic hydrotreating, catalytic hydrorefining, catalytic hydrocracking, catalytic reforming, catalytic cracking, crude distillation, lube oil processing, hydrogen production, isomerization, polymerization, thermal processes, and blending, sweetening, and treating processes. Petroleum refining process units include sulfur plants.

Population means the public.

Produced water means water extracted from the earth from an oil or natural gas production well, or that is separated from oil or natural gas after extraction.

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.

Process Hazard Review means a systematic identification of the potential sources and conditions that may result in the release of a regulated substance and determination of the effects of the release on the surrounding environment using generally accepted methods of risk assessment.

Public means any person except employees or contractors at the stationary source.

Public receptor means offsite residences, institutions (e.g., schools, hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxic concentrations, radiant heat, or overpressure, as a result of an accidental release.

Regulated substance is any substance listed pursuant to Section 5.130 or Sections 6.2, 6.3, or 6.4.

Replacement in kind means a replacement that satisfies the design specifications.

Retail facility means a stationary source at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program.

Risk Management Program means all the activities intended to reduce risk of a catastrophic event including, but not limited to, the consideration of technology, personnel and the equipment associated with the covered process.

Risk Management Plan or RMP means the risk management plan submission required under subpart G of Section 5. The Delaware RMP is called the Delaware Risk Management Plan.

RMP Off-site Consequent Analysis Guidance means guidance document published on May 24, 1996 by the EPA intended to assist sources to conduct worst-case consequence analyses and alternative scenarios involving regulated substances.

Secretary means the Secretary of the Department of Natural Resources and Environmental Control.

Separate Containment Area means an area which is separated from other areas by 100 meters or which is separated from adjoining areas by 4-hour fire rated walls resistant to blast pressures of 3 psig; in addition, such areas cannot have common piping containing a regulated substance.

SIC means Standard Industrial Classification.

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. The term stationary source does not apply to transportation, including storage incident to transportation, of any regulated substance or any other extremely hazardous substance under the provisions of this regulation. A stationary source includes transportation containers used for storage not incident to transportation and transportation containers connected to equipment at a stationary source for loading or unloading. Transportation includes, but is not limited to, transportation subject to oversight or regulation under 49 CFR parts 192, 193, or 195, or a state natural gas or hazardous liquid program for which the state has in effect a certification to DOT under 49 U.S.C. Section 60105. A stationary source does not include naturally occurring hydrocarbon reservoirs. Properties shall not be considered contiguous solely because of a railroad or pipeline right-of-way.

Substance Hazard Index (SHI) means a calculated number which relates the relative danger of a substance considering toxicity and ability to disperse in the atmosphere.

Sufficient Quantity (SQ) means the amount of regulated substance sufficient to cause a catastrophic event. The sufficient quantity shall be calculated based on commonly recognized atmospheric modeling procedures and mortality/exposure probabilities calculated for an average individual. For flammable and combustible substances, the sufficient quantity is expressed as a release rate. For toxic and explosive substances it is expressed as a distinct quantity.

Technically qualified individual means a person or persons (1) who, because of education, training, or experience, or a combination of these factors, is capable of understanding the health and environmental risks associated with the chemical substance which is used under his or her supervision, (2) who is responsible for enforcing appropriate methods of conducting scientific experimentation, analysis, or chemical research to minimize such risks, and (3) who is responsible for the safety assessments and clearances related to the procurement, storage, use, and disposal of the chemical substance as may be appropriate or required within the scope of conducting a research and development activity.

Threshold quantity means the quantity specified for regulated substances pursuant to Section 112(r)(5) of the Clean Air Act as amended, listed in Section 5.130 and determined to be present at a stationary source as specified in Section 5.115.

Typical meteorological conditions means the temperature, wind speed, cloud cover, and atmospheric stability class, prevailing at the site based on data gathered at or near the site or from a local meteorological station.

Unit means the nearest whole number resulting from the division of the actual quantity by the sufficient quantity at 100 meters as set forth in Sections 6.2, 6.3, or 6.4 of this regulation and the nearest whole number resulting from the division of the actual quantity by the threshold quantity as set forth in Section 5.130 of this regulation. For stationary sources reporting propane or ammonium nitrate with a *potential release quantity* equal to or greater than the *sufficient quantity* in their risk management plan, the units will equal one, regardless of the *actual quantity*.

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

Worst-case release means the release of the largest quantity of a regulated substance from a vessel or process line failure that results in the greatest distance to an endpoint defined in Section 5.22.1.

5.0 Accidental Release Prevention Provisions Established to Seek Delegation of 40 CFR Part 68

Subpart A - General

5.1 through 5.9 Reserved

5.10 Applicability

5.10.1 An owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process, as determined under Section 5.115, shall comply with the requirements of this regulation no later than the latest of the following dates:

5.10.1.1 June 21, 1999;

5.10.1.2 Three years after the date on which a regulated substance is first listed by EPA pursuant to 40 CFR 68.130 dated July 1, 1997; or

5.10.1.3 The date on which a regulated substance is first present above a threshold quantity in a process.

5.10.2 Program 1 eligibility requirements. A covered process is eligible for Program 1 requirements as provided in Section 5.12.2 if it meets all of the following requirements:

5.10.2.1 For the five years prior to the submission of an RMP, the process has not had an accidental release of a regulated substance where exposure to the substance, its reaction products, overpressure generated by an explosion involving the substance, or radiant heat generated by a fire involving the substance led to any of the following off-site:

5.10.2.1.1 Death;

5.10.2.1.2 Injury; or

5.10.2.1.3 Response or restoration activities for an exposure of an environmental receptor;

5.10.2.2 The distance to a toxic or flammable endpoint for a worst-case release assessment conducted under Subpart B and Section 5.25 is less than the distance to any public receptor, as defined in Section 5.30; and

5.10.2.3 Emergency response procedures have been coordinated between the stationary source and local emergency planning and response organizations.

5.10.3 Program 2 eligibility requirements. A covered process is subject to Program 2 requirements if it does not meet the eligibility requirements of either 5.10.2 or 5.10.4 of this section.

5.10.4 Program 3 eligibility requirements. A covered process is subject to Program 3 if the process does not meet the requirements of 5.10.2 of this section, and if either of the following conditions is met:

5.10.4.1 The process is in NAICS code 325181, 325211, 325311, 32532, 32411, 32211, 325188, 32511, 325192, 325199; or

5.10.4.2 The process is subject to the OSHA process safety management standard, 29 CFR 1910.119 dated July 1, 1997.

5.10.5 If at any time a covered process no longer meets the eligibility criteria of its Program level, the owner or operator shall comply with the requirements of the new Program level that applies to the process and update the RMP as provided in Section 5.190.

5.11 Reserved

5.12 General Requirements

5.12.1 General requirements. The owner or operator of a stationary source subject to this part shall submit a single RMP, as provided in Sections. 5.150 to 5.185. The RMP shall include a registration that reflects all covered processes.

5.12.2 Program 1 requirements. In addition to meeting the requirements of 5.12.1 of this section, the owner or operator of a stationary source with a process eligible for Program 1, as provided in Section 5.10.2, shall:

5.12.2.1 Analyze the worst-case release scenario for the process(es), as provided in Section 5.25; document that the nearest public receptor is beyond the distance to a toxic or flammable endpoint defined in Section 5.22.1; and submit in the RMP the worst-case release scenario as provided in Section 5.165;

5.12.2.2 Complete the five-year accident history for the process as provided in Section 5.42 of this part and submit it in the RMP as provided in Section 5.168;

5.12.2.3 Ensure that response actions have been coordinated with local emergency planning and response agencies; and

5.12.2.4Certify in the RMP the following: “Based on the criteria in Section 5.10 (40 CFR 68.10 dated July 1, 1997), the distance to the specified endpoint for the worst-case accidental release scenario for the following process(es) is less than the distance

to the nearest public receptor: [list process(es)]. Within the past five years, the process(es) has (have) had no accidental release that caused off-site impacts provided in the risk management program rule (Section 5.10.2.1). No additional measures are necessary to prevent off-site impacts from accidental releases. In the event of fire, explosion, or a release of a regulated substance from the process(es), entry within the distance to the specified endpoints may pose a danger to public emergency responders. Therefore, public emergency responders should not enter this area except as arranged with the emergency contact indicated in the RMP. The undersigned certifies that, to the best of my knowledge, information, and belief, formed after reasonable inquiry, the information submitted is true, accurate, and complete. [Signature, title, date signed]."

5.12.3 Program 2 requirements. In addition to meeting the requirements of paragraph 5.12.1 of this section, the owner or operator of a stationary source with a process subject to Program 2, as provided in Section 5.10.3, shall:

5.12.3.1 Develop and implement a management system as provided in Section 5.15;

5.12.3.2 Conduct a hazard assessment as provided in Sections. 5.20 through 5.42;

5.12.3.3 Implement the Program 2 prevention steps provided in Sections. 5.48 through 5.60 or implement the Program 3 prevention steps provided in Sections. 5.65 through 5.87;

5.12.3.4 Develop and implement an emergency response program as provided in Sections. 5.90 to 5.95; and

5.12.3.5 Submit as part of the RMP the data on prevention program elements for Program 2 processes as provided in Section 5.170.

5.12.4 Program 3 requirements. In addition to meeting the requirements of 5.12.1 of this section, the owner or operator of a stationary source with a process subject to Program 3, as provided in Section 5.10.4 shall:

5.12.4.1 Develop and implement a management system as provided in Section 5.15;

5.12.4.2 Conduct a hazard assessment as provided in Sections. 5.20 through 5.42;

5.12.4.3 Implement the prevention requirements of Sections. 5.65 through 5.87;

5.12.4.4 Develop and implement an emergency response program as provided in Sections. 5.90 to 5.95 of this part; and

5.12.5 Submit as part of the RMP the data on prevention program elements for Program 3 processes as provided in Section 5.175.

5.13 and 5.14 Reserved

5.15 Management

5.15.1 The owner or operator of a stationary source with processes subject to Program 2 or Program 3 shall develop a management system to oversee the implementation of the risk management program elements.

5.15.2 The owner or operator shall assign a qualified person or position that has the overall responsibility for the development, implementation, and integration of the risk management program elements.

5.15.3 When responsibility for implementing individual requirements of this part is assigned to persons other than the person identified under 5.15.2 of this section, the names or positions of these people shall be documented and the lines of authority defined through an organization chart or similar document.

Subpart B-Hazard Assessment

5.16 through 5.19 Reserved

5.20 Applicability

An owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process, as determined under Section 5.115, shall prepare a worst-case release scenario analysis as provided in Section 5.25 of this part and complete the five-year accident history as provided in Section 5.42. The owner or operator of a Program 2 and 3 process must comply with all sections in this subpart for these processes.

5.21 Reserved

5.22 Off-site Consequence Analysis Parameters

5.22.1 Endpoints. For analyses of off-site consequences, the following endpoints shall be used:

5.22.1.1 Toxics. The toxic endpoints provided in Table 3 of this part.

5.22.1.2 Flammables. The endpoints for flammables vary according to the scenarios studied:

5.22.1.2.1 Explosion. An overpressure of 1 psi.

5.22.1.2.2 Radiant heat/exposure time. A radiant heat of 5 kw/m^2 for 40 seconds.

5.22.1.2.3 Lower flammability limit. A lower flammability limit as provided in NFPA documents or other generally recognized sources.

5.22.2 Wind speed/atmospheric stability class. For the worst-case release analysis, the owner or operator shall use a wind speed of 1.5 meters per second and atmospheric stability class of F. If the owner or operator can demonstrate that local meteorological data applicable to the stationary source show a higher minimum wind speed or less stable atmosphere at all times during the previous three years, these minimums may be used. For analysis of alternative scenarios, the owner or operator may use the typical meteorological conditions for the stationary source.

5.22.3 Ambient temperature/humidity. For worst-case release analysis of a regulated toxic substance, the owner or operator shall use the highest daily maximum temperature in the previous three years and average humidity for the site, based on temperature/humidity data gathered at the stationary source or at a local meteorological station; an owner or operator using the RMP Off-site Consequence Analysis Guidance may use 25 deg.C and 50 percent humidity as values for these variables. For analysis of alternative scenarios, the owner or operator may use typical temperature/humidity data gathered at the stationary source or at a local meteorological station.

5.22.4 Height of release. The worst-case release of a regulated toxic substance shall be analyzed assuming a ground level (0 feet) release. For an alternative scenario analysis of a regulated toxic substance, release height may be determined by the release scenario.

5.22.5 Surface roughness. The owner or operator shall use either urban or rural topography, as appropriate. Urban means that there are many obstacles in the immediate area; obstacles include buildings or trees. Rural means there are no buildings in the immediate area and the terrain is generally flat and unobstructed.

5.22.6 Dense or neutrally buoyant gases. The owner or operator shall ensure that tables or models used for dispersion analysis of regulated toxic substances appropriately account for gas density.

5.22.7 Temperature of released substance. For worst case, liquids other than gases liquified by refrigeration only shall be considered to be released at the highest daily maximum temperature, based on data for the previous three years appropriate for the stationary source, or at process temperature, whichever is higher. For alternative scenarios, substances may be considered to be released at a process or ambient temperature that is appropriate for the scenario.

5.23 through 5.24 Reserved

5.25 Worst-Case Release Scenario Analysis

5.25.1 The owner or operator shall analyze and report in the RMP:

5.25.1.1 For Program 1 processes, one worst-case release scenario for each Program 1 process;

5.25.1.2 For Program 2 and 3 processes:

5.25.1.2.1 One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint provided in Table 3 of this regulation resulting from an accidental release of regulated toxic substances from covered processes under worst-case conditions defined in Section 5.22;

5.25.1.2.2 One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint defined in Section 5.22.1 resulting from an accidental release of regulated flammable substances from covered processes under worst-case conditions defined in Section 5.22; and

5.25.1.2.3 Additional worst-case release scenarios for a hazard class if a worst-case release from another covered process at the stationary source potentially affects public receptors different from those potentially affected by the worst-case release scenario developed under 5.25.1.2.1 or 5.25.1.2.2 of this section.

5.25.2 Determination of worst-case release quantity. The worst-case release quantity shall be the greater of the following:

5.25.2.1 For substances in a vessel, the greatest amount held in a single vessel, taking into account administrative controls that limit the maximum quantity; or

5.25.2.2 For substances in pipes, the greatest amount in a pipe, taking into account administrative controls that limit the maximum quantity.

5.25.3 Worst-case release scenario-toxic gases.

5.25.3.1 For regulated toxic substances that are normally gases at ambient temperature and handled as a gas or as a liquid under pressure, the owner or operator shall assume that the quantity in the vessel or pipe, as determined under 5.25.2 of this section, is released as a gas over 10 minutes. The release rate shall be assumed to be the total quantity divided by 10 unless passive mitigation systems are in place.

5.25.3.2 For gases handled as refrigerated liquids at ambient pressure:

5.25.3.2.1 If the released substance is not contained by passive mitigation systems or if the contained pool would have a depth of 1 cm or less, the owner or operator shall assume that the substance is released as a gas in 10 minutes;

5.25.3.2.2 If the released substance is contained by passive mitigation systems in a pool with a depth greater than 1 cm, the owner or operator may assume that the quantity in the vessel or pipe, as determined under 5.25.2 of this section, is spilled instantaneously to form a liquid pool. The volatilization rate (release rate) shall be calculated at the boiling point of the substance and at the conditions specified in 5.25.4 of this section.

5.25.4 Worst-case release scenario-toxic liquids.

5.25.4.1 For regulated toxic substances that are normally liquids at ambient temperature, the owner or operator shall assume that the quantity in the vessel or pipe, as determined under 5.25.2 of this section, is spilled instantaneously to form a liquid pool.

5.25.4.1.1 The surface area of the pool shall be determined by assuming that the liquid spreads to 1 centimeter deep unless passive mitigation systems are in place that serve to contain the spill and limit the surface area. Where passive mitigation is in place, the surface area of the contained liquid shall be used to calculate the volatilization rate.

5.25.4.2 If the release would occur onto a surface that is not paved or smooth, the owner or operator may take into account the actual surface characteristics.

5.25.4.2.1 The volatilization rate shall account for the highest daily maximum temperature occurring in the past three years, the temperature of the substance in the vessel, and the concentration of the substance if the liquid spilled is a mixture or solution.

5.25.4.3 The rate of release to air shall be determined from the volatilization rate of the liquid pool. The owner or operator may use the methodology in the RMP Off-site Consequence Analysis Guidance or any other publicly available techniques that account for the modeling conditions and are recognized by industry as applicable as part of current practices. Proprietary models that account for the modeling conditions may be used provided the owner or operator allows the Department access to the model and describes model features and differences from publicly available models to local emergency planners upon request.

5.25.5 Worst-case release scenario-flammables. The owner or operator shall assume that the quantity of the substance, as determined under 5.25.2 of this section, vaporizes resulting in a vapor cloud explosion. A yield factor of 10 percent of the available energy released in

the explosion shall be used to determine the distance to the explosion endpoint if the model used is based on TNT-equivalent methods.

5.25.6 Parameters to be applied. The owner or operator shall use the parameters defined in Section 5.22 to determine distance to the endpoints. The owner or operator may use the methodology provided in the RMP Off-site Consequence Analysis Guidance or any commercially or publicly available air dispersion modeling techniques, provided the techniques account for the modeling conditions and are recognized by industry as applicable as part of current practices. Proprietary models that account for the modeling conditions may be used provided he owner or operator allows the Department access to the model and describes model features and differences from publicly available models to local emergency planners upon request.

5.25.7 Consideration of passive mitigation. Passive mitigation systems may be considered for the analysis of worst case provided that the mitigation system is capable of withstanding the release event triggering the scenario and would still function as intended.

5.25.8 Factors in selecting a worst-case scenario. Notwithstanding the provisions of 5.25.2 of this section, the owner or operator shall select as the worst case for flammable regulated substances or the worst case for regulated toxic substances, a scenario based on the following factors if such a scenario would result in a greater distance to an endpoint defined in Section 5.22.1 beyond the stationary source boundary than the scenario provided under 5.25.2 of this section:

5.25.8.1 Smaller quantities handled at higher process temperature or pressure; and

5.25.8.2 Proximity to the boundary of the stationary source.

5.26 and 5.27 Reserved

5.28 Alternative Release Scenario Analysis

5.28.1 The number of scenarios. The owner or operator of Program 2 and Program 3 processes shall identify and analyze at least one alternative release scenario for each regulated toxic substance held in a covered process(es) and at least one alternative release scenario to represent all flammable substances held in covered processes.

5.28.2 Scenarios to consider.

5.28.2.1 For each scenario required under 5.28.1 of this section, the owner or operator shall select a scenario:

5.28.2.1.1 That is more likely to occur than the worst-case release scenario under Section 5.25; and

5.28.2.1.2 That will reach an endpoint off-site, unless no such scenario exists.

5.28.2.2 Release scenarios considered should include, but are not limited to, the following, where applicable:

5.28.2.2.1 Transfer hose releases due to splits or sudden hose uncoupling;

5.28.2.2.2 Process piping releases from failures at flanges, joints, welds, valves and valve seals, and drains or bleeds;

5.28.2.2.3 Process vessel or pump releases due to cracks, seal failure, or drain, bleed, or plug failure;

5.28.2.2.4 Vessel overfilling and spill, or over-pressurization and venting through relief valves or rupture disks; and

5.28.2.2.5 Shipping container mishandling and breakage or puncturing leading to a spill.

5.28.3 Parameters to be applied. The owner or operator shall use the appropriate parameters defined in Section 5.22 to determine distance to the endpoints. The owner or operator may use either the methodology provided in the RMP Off-site Consequence Analysis Guidance or any commercially or publicly available air dispersion modeling techniques, provided the techniques account for the specified modeling conditions and are recognized by industry as applicable as part of current practices. Proprietary models that account for the modeling conditions may be used provided the owner or operator allows the Department access to the model and describes model features and differences from publicly available models to local emergency planners upon request.

5.28.4 Consideration of mitigation. Active and passive mitigation systems may be considered provided they are capable of withstanding the event that triggered the release and would still be functional.

5.28.5 Factors in selecting scenarios. The owner or operator shall consider the following in selecting alternative release scenarios:

5.28.5.1 The five-year accident history provided in Section 5.42; and

5.28.5.2 Failure scenarios identified under Section 5.50 or Section 5.67.

5.29 Reserved

5.30 Defining Off-site Impacts-Population

5.30.1 The owner or operator shall estimate in the RMP the population within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in Section 5.22.1.

5.30.2 Population to be defined. Population shall include residential population. The presence of institutions (schools, hospitals, prisons), parks and recreational areas, and major commercial, office, and industrial buildings shall be noted in the RMP.

5.30.3 Data sources acceptable. The owner or operator may use the most recent census data, or other updated information, to estimate the population potentially affected.

5.30.4 Level of accuracy. Population shall be estimated to two significant digits.

5.31 and 5.32 Reserved

5.33 Defining Off-site Impacts–environment

5.33.1 The owner or operator shall list in the RMP environmental receptors within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in Section 5.22.1 of this part.

5.33.2 Data sources acceptable. The owner or operator may rely on information provided on local U.S. Geological Survey maps or on any data source containing U.S.G.S. data to identify environmental receptors.

5.34 and 5.35 Reserved

5.36 Review and Update

5.36.1 The owner or operator shall review and update the off-site consequence analyses at least once every five years.

5.36.2 If changes in processes, quantities stored or handled, or any other aspect of the stationary source might reasonably be expected to increase or decrease the distance to the endpoint by a factor of two or more, the owner or operator shall complete a revised analysis within six months of the change and submit a revised risk management plan as provided in Section 5.190.

5.37 and 5.38 Reverved

5.39 Documentation. The owner or operator shall maintain the following records on the off-site consequence analyses:

5.39.1 For worst-case scenarios, a description of the vessel or pipeline and substance selected as worst case, assumptions and parameters used, and the rationale for selection; assumptions shall include use of any administrative controls and any passive mitigation that were assumed to limit the quantity that could be released. Documentation shall include the anticipated effect of the controls and mitigation on the release quantity and rate.

5.39.2 For alternative release scenarios, a description of the scenarios identified, assumptions and parameters used, and the rationale for the selection of specific scenarios; assumptions shall include use of any administrative controls and any mitigation that were assumed to limit the quantity that could be released. Documentation shall include the effect of the controls and mitigation on the release quantity and rate.

5.39.3 Documentation of estimated quantity released, release rate, and duration of release.

5.39.4 Methodology used to determine distance to endpoints.

5.39.5 Data used to estimate population and environmental receptors potentially affected.

5.40 and 5.41 Reserved

5.42 Five-Year Accident History.

5.42.1 The owner or operator shall include in the five-year accident history all accidental releases from covered processes that resulted in deaths, injuries, or significant property damage on site, or known off-site deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage.

5.42.2 Data required. For each accidental release included, the owner or operator shall report the following information:

5.42.2.1 Date, time, and approximate duration of the release;

5.42.2.2 Chemical(s) released;

5.42.2.3 Estimated quantity released in pounds and, for mixtures containing regulated toxic substances, percentage concentration by weight of the released regulated toxic substance in the liquid mixture;

5.42.2.4 Five- or six-digit NAICS code that most closely corresponds to the process;

5.42.2.5 The type of release event and its source;

5.42.2.6 Weather conditions, if known;

5.42.2.7 On-site impacts;

5.42.2.8 Known off-site impacts;

5.42.2.9 Initiating event and contributing factors, if known;

5.42.2.10 Whether off-site responders were notified, if known; and

5.42.2.11 Operational or process changes that resulted from investigation of the release and that have been made by the time this information is submitted in accordance with 5.168.

5.42.3 Level of accuracy. Numerical estimates may be provided to two significant digits.

Subpart C - Program 2 Prevention Program

5.43 through 5.47 Reserved

5.48 Safety Information

5.48.1 The owner or operator shall compile and maintain the following up-to-date safety information related to the regulated substances, processes, and equipment:

5.48.1.1 Material Safety Data Sheets that meet the requirements of 29 CFR 1910.1200(g) dated July 1, 1997;

5.48.1.2 Maximum intended inventory of equipment in which the regulated substances are stored or processed;

5.48.1.3 Safe upper and lower temperatures, pressures, flows, and compositions;

5.48.1.4 Equipment specifications; and

5.48.1.5 Codes and standards used to design, build, and operate the process.

5.48.2 The owner or operator shall ensure that the process is designed in compliance with recognized and generally accepted good engineering practices. Compliance with Federal or state regulations that address industry-specific safe design or with industry-specific design codes and standards may be used to demonstrate compliance with this paragraph.

5.48.3 The owner or operator shall update the safety information if a major change occurs that makes the information inaccurate.

5.49 Reserved

5.50 Hazard Review

5.50.1 The owner or operator shall conduct a review of the hazards associated with the regulated substances, process, and procedures. The review shall identify the following:

5.50.1.1 The hazards associated with the process and regulated substances;

5.50.1.2 Opportunities for equipment malfunctions or human errors that could cause an accidental release;

5.50.1.3 The safeguards used or needed to control the hazards or prevent equipment malfunction or human error; and

5.50.1.4 Any steps used or needed to detect or monitor releases.

5.50.2 The owner or operator may use checklists developed by persons or organizations knowledgeable about the process and equipment as a guide to conducting the review. For processes designed to meet industry standards or Federal or state design rules, the hazard review shall, by inspecting all equipment, determine whether the process is designed, fabricated, and operated in accordance with the applicable standards or rules.

5.50.3 The owner or operator shall document the results of the review and ensure that problems identified are resolved in a timely manner.

5.50.4 The review shall be updated at least once every five years. The owner or operator shall also conduct reviews whenever a major change in the process occurs; all issues identified in the review shall be resolved before startup of the changed process.

5.51 Reserved

5.52 Operating Procedures

5.52.1 The owner or operator shall prepare written operating procedures that provide clear instructions or steps for safely conducting activities associated with each covered process consistent with the safety information for that process. Operating procedures or instructions provided by equipment manufacturers or developed by persons or organizations knowledgeable about the process and equipment may be used as a basis for a stationary source's operating procedures.

5.52.2 The procedures shall address the following:

5.52.2.1 Initial startup;

5.52.2.2 Normal operations;

5.52.2.3 Temporary operations;

5.52.2.4 Emergency shutdown and operations;

5.52.2.5 Normal shutdown;

5.52.2.6 Startup following a normal or emergency shutdown or a major change that requires a hazard review;

5.52.2.7 Consequences of deviations and steps required to correct or avoid deviations; and

5.52.2.8 Equipment inspections.

5.52.3 The owner or operator shall ensure that the operating procedures are updated, if necessary, whenever a major change occurs and prior to startup of the changed process.

5.53 Reserved

5.54 Training

5.54.1 The owner or operator shall ensure that each employee presently operating a process, and each employee newly assigned to a covered process have been trained or tested competent in the operating procedures provided in Section 5.52 that pertain to their duties. For those employees already operating a process on June 21, 1999, the owner or operator may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as provided in the operating procedures.

5.54.2 Refresher training. Refresher training shall be provided at least every three years, and more often if necessary, to each employee operating a process to ensure that the employee understands and adheres to the current operating procedures of the process. The owner or operator, in consultation with the employees operating the process, shall determine the appropriate frequency of refresher training.

5.54.3 The owner or operator may use training conducted under Federal or state regulations or under industry-specific standards or codes or training conducted by covered process equipment vendors to demonstrate compliance with this section to the extent that the training meets the requirements of this section.

5.54.4 The owner or operator shall ensure that operators are trained in any updated or new procedures prior to startup of a process after a major change.

5.55 Reserved

5.56 Maintenance

5.56.1 The owner or operator shall prepare and implement procedures to maintain the on-going mechanical integrity of the process equipment. The owner or operator may use procedures or instructions provided by covered process equipment vendors or procedures in Federal or state regulations or industry codes as the basis for stationary source maintenance procedures.

5.56.2 The owner or operator shall train or cause to be trained each employee involved in maintaining the on-going mechanical integrity of the process. To ensure that the employee can perform the job tasks in a safe manner, each such employee shall be trained in the hazards of the process, in how to avoid or correct unsafe conditions, and in the procedures applicable to the employee's job tasks.

5.56.3 Any maintenance contractor shall ensure that each contract maintenance employee is trained to perform the maintenance procedures developed under 5.56.1 of this section.

5.56.4 The owner or operator shall perform or cause to be performed inspections and tests on process equipment. Inspection and testing procedures shall follow recognized and generally accepted good engineering practices. The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturers' recommendations, industry standards or codes, good engineering practices, and prior operating experience.

5.57 Reserved

5.58 Compliance Audits

5.58.1 The owner or operator shall certify that they have evaluated compliance with the provisions of this subpart at least every three years to verify that the procedures and practices developed under the rule are adequate and are being followed.

5.58.2 The compliance audit shall be conducted by at least one person knowledgeable in the process.

5.58.3 The owner or operator shall develop a report of the audit findings.

5.58.4 The owner or operator shall promptly determine and document an appropriate response to each of the findings of the compliance audit and document that deficiencies have been corrected.

5.58.5 The owner or operator shall retain the two (2) most recent compliance audit reports. This requirement does not apply to any compliance audit report that is more than five years old.

5.59 Reserved

5.60 Incident Investigation

5.60.1 The owner or operator shall investigate each incident which resulted in, or could reasonably have resulted in a catastrophic release.

5.60.2 An incident investigation shall be initiated as promptly as possible, but not later than 48 hours following the incident.

5.60.3 A summary shall be prepared at the conclusion of the investigation which includes at a minimum:

5.60.3.1 Date of incident;

5.60.3.2 Date investigation began;

5.60.3.3 A description of the incident;

5.60.3.4 The factors that contributed to the incident; and,

5.60.3.5 Any recommendations resulting from the investigation.

5.60.4 The owner or operator shall promptly address and resolve the investigation findings and recommendations. Resolutions and corrective actions shall be documented.

5.60.5 The findings shall be reviewed with all affected personnel whose job tasks are affected by the findings.

5.60.6 Investigation summaries shall be retained for five years.

Subpart D -Program 3 Prevention Program

5.61 through 5.64 Reserved

5.65 Process Safety Information

5.65.1 In accordance with the schedule set forth in Section 5.67, the owner or operator shall complete a compilation of written process safety information before conducting any process hazard analysis required by this subpart. The compilation of written process safety information is to enable the owner or operator and the employees involved in operating the process to identify and understand the hazards posed by those processes involving regulated substances. This process safety information shall include information pertaining to the hazards of the regulated substances used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

5.65.2 Information pertaining to the hazards of the regulated substances in the process. This information shall consist of at least the following:

5.65.2.1 Toxicity information;

5.65.2.2 Permissible exposure limits;

5.65.2.3 Physical data;

5.65.2.4 Reactivity data;

5.65.2.5 Corrosion data;

5.65.2.6 Thermal and chemical stability data; and

5.65.2.7 Hazardous effects of inadvertent mixing of different materials that could foreseeably occur.

Note: Material Safety Data Sheets meeting the requirements of 29 CFR 1910.1200(g) dated July 1, 1997 may be used to comply with this requirement to the extent they contain the information required by this subparagraph.

5.65.3 Information pertaining to the technology of the process.

5.65.3.1 Information concerning the technology of the process shall include at least the following:

5.65.3.1.1 A block flow diagram or simplified process flow diagram;

5.65.3.1.2 Process chemistry;

5.65.3.1.3 Maximum intended inventory;

5.65.3.1.4 Safe upper and lower limits for such items as temperatures, pressures, flows or compositions; and

5.65.3.1.5 An evaluation of the consequences of deviations.

5.65.3.2 Where the original technical information no longer exists, such information may be developed in conjunction with the process hazard analysis in sufficient detail to support the analysis.

5.65.4 Information pertaining to the equipment in the process.

5.65.4.1 Information pertaining to the equipment in the process shall include:

5.65.4.1.1 Materials of construction;

5.65.4.1.2 Piping and instrument diagrams (P and ID's);

5.65.4.1.3 Electrical classification;

5.65.4.1.4 Relief system design and design basis;

5.65.4.1.5 Ventilation system design;

5.65.4.1.6 Design codes and standards employed;

5.65.4.1.7 Material and energy balances for processes built after June 21, 1999; and

5.65.4.1.8 Safety systems (e.g. interlocks, detection or suppression systems).

5.65.4.2 The owner or operator shall document that equipment complies with recognized and generally accepted good engineering practices.

5.65.4.3 For existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in general use, the owner or operator shall determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

5.66 Reserved

5.67 Process Hazard Analysis

5.67.1 The owner or operator shall perform an initial process hazard analysis on processes covered by Program Level 3. The process hazard analysis shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process. The owner or operator shall determine and document the priority order for conducting process hazard analyses based on a rationale which includes such considerations as extent of the process hazards, number of potentially affected employees, age of the process, and operating history of the process. The process hazard analysis shall be conducted as soon as possible, but not later than June 21, 1999. Process hazards analyses completed to comply with 29 CFR 1910.119(e)dated July 1, 1997 are acceptable as initial process hazards analyses. These process hazard analyses shall be updated and revalidated, based on their completion date.

5.67.2 The owner or operator shall use one or more of the following methodologies that are appropriate to determine and evaluate the hazards of the process being analyzed.

5.67.2.1 What-If;

5.67.2.2 Checklist;

5.67.2.3 What-If/Checklist;

5.67.2.4 Hazard and Operability Study (HAZOP);

5.67.2.5 Failure Mode and Effects Analysis (FMEA);

5.67.2.6 Fault Tree Analysis; or

5.67.2.7 An appropriate equivalent methodology.

5.67.3 The process hazard analysis shall address:

5.67.3.1 The hazards of the process;

5.67.3.2 The identification of any previous incident which had a likely potential for catastrophic consequences;

5.67.3.3 Engineering and administrative controls applicable to the hazards and their interrelationships such as appropriate application of detection methodologies to provide early warning of releases. (Acceptable detection methods might include process monitoring and control instrumentation with alarms, and detection hardware such as hydrocarbon sensors.);

5.67.3.4 Consequences of failure of engineering and administrative controls;

5.67.3.5 Stationary source siting;

5.67.3.6 Human factors; and

5.67.3.7 A qualitative evaluation of a range of the possible safety and health effects of failure of controls.

5.67.4 The process hazard analysis shall be performed by a team with expertise in engineering and process operations, and the team shall include at least one employee who has experience and knowledge specific to the process being evaluated. Also, one member of the team must be knowledgeable in the specific process hazard analysis methodology being used.

5.67.5 The owner or operator shall establish a system to promptly address the team's findings and recommendations; assure that the recommendations are resolved in a timely manner and that the resolution is documented; document what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be completed; communicate the actions to operating,, maintenance, and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.

5.67.6 At least every five (5) years after the completion of the initial process hazard analysis, the process hazard analysis shall be updated and revalidated by a team meeting the requirements in 5.67.4 of this section, to assure that the process hazard analysis is consistent with the current process. Updated and revalidated process hazard analyses completed to comply with 29 CFR 1910.119(e) dated July 1, 1997 are acceptable to meet the requirements of this paragraph.

5.67.7 The owner or operator shall retain process hazards analyses and updates or revalidations for each process covered by this section, as well as the documented resolution of recommendations described in 5.67.5 of this section for the life of the process.

5.68 Reserved

5.69 Operating Procedures

5.69.1 The owner or operator shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process

consistent with the process safety information and shall address at least the following elements.

5.69.1.1 Steps for each operating phase:

5.69.1.1.1 Initial startup;

5.69.1.1.2 Normal operations;

5.69.1.1.3 Temporary operations;

5.69.1.1.4 Emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner;

5.69.1.1.5 Emergency operations;

5.69.1.1.6 Normal shutdown; and,

5.69.1.1.7 Startup following a turnaround, or after an emergency shutdown.

5.69.1.2 Operating limits:

5.69.1.2.1 Consequences of deviation and

5.69.1.2.2 Steps required to correct or avoid deviation.

5.69.1.3 Safety and health considerations:

5.69.1.3.1 Properties of, and hazards presented by, the chemicals used in the process;

5.69.1.3.2 Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment;

5.69.1.3.3 Control measures to be taken if physical contact or airborne exposure occurs;

5.69.1.3.4 Quality control for raw materials and control of hazardous chemical inventory levels and,

5.69.1.3.5 Any special or unique hazards.

5.69.1.4 Safety systems and their functions.

5.69.2 Operating procedures shall be readily accessible to employees who work in or maintain a process.

5.69.3 The operating procedures shall be reviewed as often as necessary to assure that they reflect current operating practice, including changes that result from changes in process chemicals, technology, and equipment, and changes to stationary sources. The owner or operator shall certify annually that these operating procedures are current and accurate.

5.69.4 The owner or operator shall develop and implement safe work practices to provide for the control of hazards during operations such as lockout/tagout; confined space entry; opening process equipment or piping; and control over entrance into a stationary source

by maintenance, contractor, laboratory, or other support personnel. These safe work practices shall apply to employees and contractor employees.

5.70 Reserved

5.71 Training.

5.71.1 Initial training.

5.71.1.1 Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in Section 5.69. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.

5.71.1.2 In lieu of initial training for those employees already involved in operating a process on June 21, 1999, an owner or operator may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures.

5.71.2 Refresher training. Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The owner or operator, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.

5.71.3 Training documentation. The owner or operator shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The owner or operator shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.

5.72 Reserved

5.73 Mechanical Integrity

5.73.1 Application. Paragraphs 5.73.2 through 5.73.6 of this section apply to the following process equipment:

5.73.1.1 Pressure vessels and storage tanks;

5.73.1.2 Piping systems (including piping components such as valves);

5.73.1.3 Relief and vent systems and devices;

5.73.1.4 Emergency shutdown systems;

5.73.1.5 Controls (including monitoring devices and sensors, alarms, and interlocks); and

5.73.1.6 Pumps.

5.73.2 Written procedures. The owner or operator shall establish and implement written procedures to maintain the on-going integrity of process equipment.

5.73.3 Training for process maintenance activities. The owner or operator shall train each employee involved in maintaining the on-going integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

5.73.4 Inspection and testing.

5.73.4.1 Inspections and tests shall be performed on process equipment.

5.73.4.2 Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.

5.73.4.3 The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturers' recommendations and good engineering practices, and more frequently if determined to be necessary by prior operating experience.

5.73.4.4 The owner or operator shall document each inspection and test that has been performed on process equipment. The documentation shall identify the date of the inspection or test, the name of the person who performed the inspection or test, the serial number or other identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed, and the results of the inspection or test.

5.73.5 Equipment deficiencies. The owner or operator shall correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information in Section 5.65) before further use or in a safe and timely manner when necessary means are taken to assure safe operation.

5.73.6 Quality assurance.

5.73.6.1 In the construction of new plants and equipment, the owner or operator shall assure that equipment as it is fabricated is suitable for the process application for which they will be used.

5.73.6.2 Appropriate checks and inspections shall be performed to assure that equipment is installed properly and consistent with design specifications and the manufacturer's instructions.

5.73.6.3 The owner or operator shall assure that maintenance materials, spare parts and equipment are suitable for the process application for which they will be used.

5.74 Reserved

5.75 Management of Change

5.75.1 The owner or operator shall establish and implement written procedures to manage changes (except for ‘replacements in kind’) to process chemicals, technology, equipment, and procedures; and, changes to stationary sources that affect a covered process.

5.75.2 The procedures shall assure that the following considerations are addressed prior to any change:

5.75.2.1 The technical basis for the proposed change;

5.75.2.2 Impact of change on safety and health;

5.75.2.3 Modifications to operating procedures;

5.75.2.4 Necessary time period for the change; and,

5.75.2.5 Authorization requirements for the proposed change.

5.75.3 Employees involved in operating a process and maintenance and contract employees whose job tasks will be affected by a change in the process shall be informed of, and trained in, the change prior to start-up of the process or affected part of the process.

5.75.4 If a change covered by this paragraph results in a change in the process safety information required by Section 5.65 of this part, such information shall be updated accordingly.

5.75.5 If a change covered by this paragraph results in a change in the operating procedures or practices required by Section 5.69, such procedures or practices shall be updated accordingly.

5.76 Reserved

5.77 Pre-startup Review

5.77.1 The owner or operator shall perform a pre-startup safety review for new stationary sources and for modified stationary sources when the modification is significant enough to require a change in the process safety information.

5.77.2 The pre-startup safety review shall confirm that prior to the introduction of regulated substances to a process:

5.77.2.1 Construction and equipment is in accordance with design specifications;

5.77.2.2 Safety, operating, maintenance, and emergency procedures are in place and are adequate;

5.77.2.3 For new stationary sources, a process hazard analysis has been performed and recommendations have been resolved or implemented before startup; and modified stationary sources meet the requirements contained in management of change, Section 5.75; and

5.77.2.4 Training of each employee involved in operating a process has been completed.

5.78 Reserved

5.79 Compliance Audits

5.79.1 The owner or operator shall certify that they have evaluated compliance with the provisions of this Regulation at least every three years to verify that the procedures and practices developed under the Regulation are adequate and are being followed.

5.79.2 The compliance audit shall be conducted by at least one person knowledgeable in the process.

5.79.3 A report of the findings of the audit shall be developed.

5.79.4 The owner or operator shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected.

5.79.5 The owner or operator shall retain the two (2) most recent compliance audit reports.

5.80 Reserved

5.81 Incident Investigation

5.81.1 The owner or operator shall investigate each incident which resulted in, or could reasonably have resulted in a catastrophic release of a regulated substance.

5.81.2 An incident investigation shall be initiated as promptly as possible, but not later than 48 hours following the incident.

5.81.3 An incident investigation team shall be established and consist of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident.

5.81.4 A report shall be prepared at the conclusion of the investigation which includes at a minimum:

5.81.4.1 Date of incident;

5.81.4.2 Date investigation began;

5.81.4.3 A description of the incident;

5.81.4.4 The factors that contributed to the incident; and,

5.81.4.5 Any recommendations resulting from the investigation.

5.81.5 The owner or operator shall establish a system to promptly address and resolve the incident report findings and recommendations. Resolutions and corrective actions shall be documented.

5.81.6 The report shall be reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable.

5.81.7 Incident investigation reports shall be retained for five years.

5.82 Reserved

5.83 Employee Participation

5.83.1 The owner or operator shall develop a written plan of action regarding the implementation of the employee participation required by this section.

5.83.2 The owner or operator shall consult with employees and their representatives on the conduct and development of process hazards analyses and on the development of the other elements of process safety management in this regulation.

5.83.3 The owner or operator shall provide to employees and their representatives access to process hazard analyses and to all other information required to be developed under this regulation.

5.84 Reserved

5.85 Hot Work Permit

5.85.1 The owner or operator shall issue a hot work permit for hot work operations conducted on or near a covered process.

5.85.2 The permit shall document that the fire prevention and protection requirements in 29 CFR 1910.252(a)dated July 1, 1997 have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit shall be kept on file until completion of the hot work operations.

5.86 Reserved

5.87 Contractors

5.87.1 Application. This section applies to contractors performing maintenance or repair, turnaround, major renovation, or specialty work on or adjacent to a covered process. It does not apply to contractors providing incidental services which do not influence process safety, such as janitorial work, food and drink services, laundry, delivery or other supply services.

5.87.2 Owner or operator responsibilities.

5.87.2.1 The owner or operator, when selecting a contractor, shall obtain and evaluate information regarding the contract owner or operator's safety performance and programs.

5.87.2.2 The owner or operator shall inform contract owner or operator of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.

5.87.2.3 The owner or operator shall explain to the contract owner or operator the applicable provisions of subpart E of this regulation.

5.87.2.4 The owner or operator shall develop and implement safe work practices consistent with Section 5.69.4, to control the entrance, presence, and exit of the contract owner or operator and contract employees in covered process areas.

5.87.2.5 The owner or operator shall periodically evaluate the performance of the contract owner or operator in fulfilling their obligations as specified in 5.87.3 of this section.

5.87.3 Contract owner or operator responsibilities.

5.87.3.1 The contract owner or operator shall assure that each contract employee is trained in the work practices necessary to safely perform his/her job.

5.87.3.2 The contract owner or operator shall assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.

5.87.3.3 The contract owner or operator shall document that each contract employee has received and understood the training required by this section. The contract owner or operator shall prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.

5.87.3.4 The contract owner or operator shall assure that each contract employee follows the safety rules of the stationary source including the safe work practices required by Section 5.69.4.

5.87.3.5 The contract owner or operator shall advise the owner or operator of any unique hazards presented by the contract owner or operator's work, or of any hazards found by the contract owner or operator's work.

Subpart E-Emergency Response

5.88 and 5.89 Reserved

5.90 Applicability

5.90.1 Except as provided in 5.90.2 of this section, the owner or operator of a stationary source with Program 2 and Program 3 processes shall comply with the requirements of Section 5.95.

5.90.2 The owner or operator of stationary source whose employees will not respond to accidental releases of regulated substances need not comply with Section 5.95 of this part provided that they meet the following:

5.90.2.1 For stationary sources with any regulated toxic substance held in a process above the threshold quantity, the stationary source is included in the community emergency response plan developed under 42 U.S.C . 11003;

5.90.2.2 For stationary sources with only regulated flammable substances held in a process above the threshold quantity, the owner or operator has coordinated response actions with the local fire department; and

5.90.2.3 Appropriate mechanisms are in place to notify emergency responders when there is a need for a response.

5.91 through 5.94 Reserved

5.95 Emergency Response Program

5.95.1 The owner or operator shall develop and implement an emergency response program for the purpose of protecting public health and the environment. Such program shall include the following elements:

5.95.1.1 An emergency response plan, which shall be maintained at the stationary source and contain at least the following elements:

5.95.1.1.1 Procedures for informing the public and local emergency response agencies about accidental releases;

5.95.1.1.2 Documentation of proper first-aid and emergency medical treatment necessary to treat accidental human exposures; and

5.95.1.1.3 Procedures and measures for emergency response after an accidental release of a regulated substance;

5.95.1.2 Procedures for the use of emergency response equipment and for its inspection, testing, and maintenance;

5.95.1.3 Training for all employees in relevant procedures; and

5.95.1.4 Procedures to review and update, as appropriate, the emergency response plan to reflect changes at the stationary source and ensure that employees are informed of changes.

5.95.2 A written plan that complies with other Federal contingency plan regulations or is consistent with the approach in the National Response Team's Integrated Contingency Plan Guidance ("One Plan") and that, among other matters, includes the elements provided in paragraph 5.95.1 of this section, shall satisfy the requirements of this section if the owner or operator also complies with paragraph 5.95.3 of this section.

5.95.3 The emergency response plan developed under paragraph 5.95.1.1 of this section shall be coordinated with the community emergency response plan developed under 42 U.S.C. 11003. Upon request of the local emergency planning committee or emergency response officials, the owner or operator shall promptly provide to the local emergency response officials information necessary for developing and implementing the community emergency response plan.

Subpart F–Regulated Substances for Accidental Release Prevention

5.96 through 5.99 Reserved

5.100 Purpose

This subpart designates substances to be listed under section 112(r)(3), (4), and (5) of the Clean Air Act, as amended and identifies their threshold quantities.

5.101 through 5.114 Reserved

5.115 Threshold Determination

5.115.1 A threshold quantity of a regulated substance listed in Section 5.130 is present at a stationary source if the total quantity of the regulated substance contained in a process exceeds the threshold.

5.115.2 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:

5.115.2.1 *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.

5.115.2.2 *Concentrations of a regulated flammable substance in a mixture.*

5.115.2.2.1 *General provision.* 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. Except as provided in paragraph 5.115.2.2 and .3 of this section, if the concentration of the substance is one percent or greater by weight of the mixture, then, for purposes of determining whether 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 have a National Fire Protection Association flammability hazard rating of 4. The demonstration shall be in accordance with the definition of flammability hazard rating 4 in the NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, National Fire Protection Association, Quincy, MA, 1996. Available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269-9101. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the Environmental Protection Agency Air Docket (6102), Attn: Docket No. A-96-O8, Waterside Mall, 401 M. St. SW., Washington D.C.; or at the Office of Federal Register at 800 North Capitol St., NW, Suite 700, Washington, D.C. Boiling point and flash point shall be defined and determined in accordance with NFPA 30, Flammable and Combustible Liquids Code, National Fire Protection Association, Quincy, MA, 1996. Available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269-9101. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the Environmental Protection Agency Air Docket (6102), Attn: Docket No. A-96-O8, Waterside Mall, 401 M. St. SW., Washington D.C.; or at the Office of Federal Register at 800 North Capitol St., NW, Suite 700, Washington, D.C. The owner or operator shall document the National Fire Protection Association flammability hazard rating.

5.115.2.2.2 *Gasoline.* Regulated substances in gasoline, when in distribution or related storage for use as fuel for internal combustion engines, need not be considered when determining whether more than a threshold quantity is present at a stationary source.

5.115.2.2.3 *Naturally occurring hydrocarbon mixtures.* Prior to entry into a natural gas processing plant or a petroleum refining process unit, regulated substances in naturally occurring hydrocarbon mixtures need not be considered when determining whether more than a threshold quantity is present at a stationary source. Naturally occurring hydrocarbon mixtures include any combination of the following: condensate, crude oil, field gas, and produced water, each as defined in Section 4.0.

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

5.115.2.4 *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:

5.115.2.4.1 Use as a structural component of the stationary source;

5.115.2.4.2 Use of products for routine janitorial maintenance;

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

5.115.2.4.4 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.

5.115.2.5 *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, the quantity of the substance need not be considered in determining whether a threshold quantity is present. This exemption does not apply to:

5.115.2.5.1 Specialty chemical production;

5.115.2.5.2 Manufacture, processing, or use of substances in pilot plant scale operations; and

5.115.2.5.3 Activities conducted outside the laboratory.

5.116 through 5.124 Reserved

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

5.126 Exclusion. Flammable Substances Used as Fuel or Held for Sale as Fuel at Retail Facilities. A flammable substance listed in Table 2 of 5.130 is nevertheless excluded from all provisions of section 5 when the substance is used as a fuel or held for sale as a fuel at a retail facility.

5.127 through 5.129 Reserved

5.130 List of Substances.

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

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

Table 1: List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention

Chemical Name	CAS #	Threshold Quantity (lbs)	Basis for Listing
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]	107-18-61	15,000	b
Allylamine [2-Propen-1-amine]	107-11-9	10,000	b
Ammonia (anhydrous)	7664-41-7	10,000	a, b
Ammonia (conc 20% or greater)	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 with methyl ether (1:1) [Boron, trifluoro[oxybis[methane]]-, T-4-	353-42-4	15,000	b
Bromine	7726-95-6	10,000	a, b
Carbon Disulfide	75-15-0	20,000	b
Chlorine	7782-50-5	2,500	a, b
Chlorine Dioxide [Chlorine oxide (ClO_2)]	10049-04-4	1,000	c
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
Crontonaldehyde, (E)-[2-Butenal, (E)-]	123-73-9	20,000	b
Cyanogen chloride	506-77-4	10,000	c
Cylclohexylamine [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 37% or greater)	7647-01-0	15,000	d
Hydrocyanic acid	74-90-8	2,500	a, b
Hydrogen chloride (anhydrous) [Hydrochloric acid]	7647-01-0	5,000	a
Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater) [Hydrofluoric acid]	7664-39-3	1,000	a, b
Hydrogen selenide	7783-07-5	500	b
Hydrogen sulfide	7783-06-4	10,000	a, b
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, methylester]	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, isocyanato-]	624-83-9	10,000	a, b
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]	8014-95-7	10,000	e
Peracetic acid [Ethaneperoxoic acid]	79-21-0	10,000	b
Perchloromethylmercaptan [methanesulfenyl chloride, trichloro-]	594-42-3	10,000	b
Phosgene [Carbonic dichloride]	75-44-5	500	a, b
Phosphine	7803-51-2	5,000	b
Phosphorus oxychloride [Phosphoyl chloride]	10025-87-3	5,000	b
Phosphorus trichloride [Phosphorous trichloride]	7719-12-2	15,000	b

Piperdine	110-89-4	15,000	b
Propionitrile [Propanenitrile]	107-12-0	10,000	b
Propyl chlorofromate [Cabonochloridic acid, proplyester]	109-61-5	15,000	b
Propyleneimne [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 (SF_4), (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 ($TiCl_4$), (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

[1] The mixture exemption in Sec. 5.115.2.1 does not apply to the substance.

Note: Basis for Listing:

a Mandated for listing by EPA by Congress in Section 112(r) of the 1990 Clean Air Act.

b Listed on the 40 CFR Part 302 EHS list dated July 1, 1997 and has a vapor pressure of 10 mmHg or greater.

c Toxic gas.

d Toxicity of hydrogen chloride, potential to release hydrogen chloride, and history of accidents.

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

Table 2: List of Regulated Flammable Substances[1] and Threshold Quantities for Accidental Release Prevention

Chemical Name	CAS #	Threshold Quantity (lbs)	Basis for Listing
Acetaldehyde	75-07-0	10,000	g
Acetylene [Ethyne]	74-86-2	10,000	f
Bromotrifluorethylene [Ethene, bromotribluoro-]	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, 2-chloro-]	557-98-2	10,000	g
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, 1,1oxybis-]	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-Butadinene, 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-Pentadinene	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 [Methylamine, 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

[1] A flammable substance when used as a fuel or held as a fuel at a retail facility is excluded from all provisions of section 5 (See 5.126).

Note: Basis for Listing:

a Mandated for listing by EPA by Congress in Section 112(r) of the 1990 Clean Air Act.

f Flammable gas.

g Volatile flammable liquid.

Table 3: List of Toxic Endpoints

CAS No.	Chemical Name	Toxic Endpoint(mg/L)
107-02-8	Acrolein [2-Propenal]	0.0011
107-13-1	Acrylonitrile [2-Propenenitrile]	0.076
814-68-6	Acrylyl chloride [2-Propenoyl chloride]	0.00090
107-18-6	Allyl alcohol [2-Propen-1-ol]	0.036
107-11-9	Allylamine [2-Propen-1-amine]	0.0032
7664-41-7	Ammonia (anhydrous)	0.14
7664-41-7	Ammonia (conc 20% or greater)	0.14
7784-34-1	Arsenous trichloride	0.010
7784-42-1	Arsine	0.0019
10294-34-5	Boron trichloride [Borane, trichloro-]	0.010
7637-07-2	Boron trifluoride [Borane, trifluoro-]	0.028
353-42-4	Boron trifluoride compound with methyl ether (1:1) [Boron,trifluoro[oxybis [methane]-,T-4	0.023
7726-95-6	Bromine	0.0065
75-15-0	Carbon disulfide	0.16
7782-50-5	Chlorine	0.0087
10049-04-4	Chlorine dioxide [Chlorine oxide (ClO2)]	0.0028
67-66-3	Chloroform [Methane, trichloro-]	0.49
542-88-1	Chloromethyl ether [Methane, oxybis[chloro-]	0.00025
107-30-2	Chloromethyl methyl ether [Methane, chloromethoxy-]	0.0018
4170-30-3	Crotonaldehyde [2-Butenal]	0.029
123-73-9	Crotonaldehyde, (E)-, [2-Butenal, (E)-]	0.029
506-77-4	Cyanogen chloride	0.030
108-91-8	Cyclohexylamine [Cyclohexanamine]	0.16
19287-45-7	Diborane	0.0011

75-78-5	Dimethyldichlorosilane [Silane, dichlorodimethyl-]	0.026
57-14-7	1,1-Dimethylhydrazine [Hydrazine, 1,1-dimethyl-]	0.012
106-89-8	Epichlorohydrin [Oxirane, (chloromethyl)-]	0.076
107-15-3	Ethylenediamine [1,2-Ethanediamine]	0.49
151-56-4	Ethyleneimine [Aziridine]	0.018
75-21-8	Ethylene oxide [Oxirane]	0.090
7782-41-4	Fluorine	0.0039
50-00-0	Formaldehyde (solution)	0.012
50-00-0	Formaldehyde (solution)	0.012
110-00-9	Furan	0.0012
302-01-2	Hydrazine	0.011
7647-01-0	Hydrochloric acid (conc 37% or greater)	0.030
74-90-8	Hydrocyanic acid	0.011
7647-01-0	Hydrogen chloride (anhydrous) [Hydrochloric acid]	0.030
7664-39-3	Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater [Hydrofluoric acid]	0.016
7783-07-5	Hydrogen selenide	0.00066
7783-06-4	Hydrogen sulfide	0.042
13463-40-6	Iron, pentacarbonyl-[Iron carbonyl (Fe(CO)5), (TB-5-11)-]	0.00044
78-82-0	Isobutyronitrile [Propanenitrile, 2-methyl-]	0.14
108-23-6	Isopropyl chloroformate [Carbonochloride acid,1-methylethyl ester]	0.10
126-98-7	Methacrylonitrile [2-Propenenitrile, 2-methyl-]	0.0027
74-87-3	Methyl chloride [Methane, chloro-]	0.82
79-22-1	Methyl chloroformate [Carbonochloridic acid, methyl ester]	0.0019
60-34-4	Methyl hydrazine [Hydrazine, methyl-]	0.0094
624-83-9	Methyl isocyanate [Methane, isocyanato-]	0.0012
74-93-1	Methyl mercaptan [Methanethiol]	0.049
556-64-9	Methyl thiocyanate [Thiocyanic acid, methyl ester]	0.085
75-79-6	Methyltrichlorosilane [Silane, trichloromethyl-]	0.018
13463-39-3	Nickel carbonyl	0.00067
7697-37-2	Nitric acid (conc 80% or greater)	0.026
10102-43-9	Nitric oxide [Nitrogen oxide (NO)]	0.031
8014-95-7	Oleum (Fuming Sulfuric acid) [Sulfuric acid, mixture with sulfur trioxide]	0.010
79-21-0	Peracetic acid [Ethaneperoxoic acid]	0.0045

594-42-3	Perchloromethylmercaptan [Methanesulfenyl chloride, trichloro-]	0.0076
75-44-5	Phosgene [Carbonic dichloride]	0.00081
7803-51-2	Phosphine	0.0035
10025-87-3	Phosphorus oxychloride [Phosphoryl chloride]	0.0030
110-89-4	Piperidine	0.022
107-12-0	Propionitrile [Propanenitrile]	0.0037
109-61-5	Propyl chloroformate [Carbonochloridic acid, propylester]	0.010
75-55-8	Propyleneimine [Aziridine, 2-methyl-]	0.12
75-56-9	Propylene oxide [Oxirane, methyl-]	0.59
7446-09-5	Sulfur dioxide (anhydrous)	0.0078
7783-60-0	Sulfur tetrafluoride [Sulfur fluoride (SF4), (T-4)-]	0.0092
7446-11-9	Sulfur trioxide	0.010
75-74-1	Tetramethyllead [Plumbane, tetramethyl-]	0.0040
509-14-8	Tetranitromethane [Methane, tetranitro-]	0.0040
7750-45-0	Titanium tetrachloride [Titanium chloride (TiCl4), (T-4-)]	0.020
584-84-9	Toluene 2,4-diisocyanate [Benzene, 2,4-diisocyanato -1-methyl-]	0.0070
91-08-7	Toluene 2,6-diisocyanate [Benzene, 1,3-diisocyanato-2-methyl-]	0.0070
26471-62-5	Toluene diisocyanate (unspecified isomer) [Benzene, 1,3-diisocyanatomethyl-]	0.0070
75-77-4	Trimethylchlorosilane [Silane, chlorotrimethyl-]	0.050
108-05-4	Vinyl acetate monomer [Acetic acid ethenyl ester]	0.26

Subpart G - Risk Management Plan

5.131 through 5.149 Reserved

5.150 Submission Note**:** The data elements of the Plan are required to be submitted to the EPA. The data elements of the plan are based upon 40 CFR 68.150 through 68.190 revised as of April 9, 2004 reprinted here under Sections 5.150 through 5.190. It is the responsibility of the owner or operator to meet the existing EPA risk management plan data submittal requirements at the time of submission.

5.150.1 The owner or operator shall submit a single RMP that includes the information required by sections 5.155 through 5.185 for all covered processes. The RMP shall be submitted in a method and format to a central point as specified by EPA as of the date of submission.

5.150.2 The owner or operator shall submit the first RMP no later than the latest of the following dates:

5.150.2.1 June 21, 1999;

5.150.2.2 Three years after the date on which a regulated substance is first listed by EPA pursuant to 5.130; or

5.150.2.3 The date on which a regulated substance is first present above a threshold quantity in a process.

5.150.3 The owner or operator of any stationary source for which an RMP was submitted before June 21, 2004, shall revise the RMP to include the information required by 5.160.2.6 and 5.160.2.14 by June 21, 2004 in the manner specified by EPA prior to that date. Any such submission shall also include the information required by 5.160.2.20 (indicating that the submission is a correction to include the information required by 5.160.2.6 and 5.160.2.14 or an update under 5.190).

5.150.4 RMPs submitted under this section shall be updated and corrected in accordance with 5.190 and 5.195.

5.150.5 Notwithstanding the provisions of 5.155 to 5.190, the RMP shall exclude classified information. Subject to appropriate procedures to protect such information from public disclosure, classified data or information excluded from the RMP may be made available in a classified annex to the RMP for review by Federal and state representatives who have received the appropriate security clearances.

5.150.6 Procedures for asserting that information submitted in the RMP is entitled to protection as confidential business information are set forth in 5.151 and 5.152.

5.151 Assertion of claims of confidential business information.

5.151.1 Except as provided in paragraph 5.141.2 of this section, an owner or operator of a stationary source required to report or otherwise provide information under this part may make a claim of confidential business information for any such information that meets the criteria set forth in 40 CFR 2.301.

5.151.2 Notwithstanding the provisions of 40 CFR part 2, an owner or operator of a stationary source subject to this part may not claim as confidential business information the following information:

5.151.2.1 Registration data required by Sec. 5.160.2.1 through 6, 8, and 5.160.2.1.10 through 13 and NAICS code and Program level of the process set forth in Sec. 5.160.2.7;

5.151.2.2 Offsite consequence analysis data required by Sec. 5.165.2.4, 9, 10, 11, and 12.

5.151.2.3 Accident history data required by Sec. 5.168;

5.151.2.4 Prevention program data required by Sec.5.170.2, 5.170.4, 5.170.5.1, and 5.170.6 through 5.170.11;

5.151.2.5 Prevention program data required by Sec. 5.175.2, 5.175.4, 5.175.5.1, 5.175.6 through 5.175.16; and

5.151.2.6 Emergency response program data required by Sec. 5.180.

5.151.3 Notwithstanding the procedures specified in 40 CFR part 2, an owner or operator asserting a claim of CBI with respect to information contained in its RMP, shall submit to EPA at the time it submits the RMP the following:

5.151.3.1 The information claimed confidential, provided in a format to be specified by EPA;

5.151.3.2 A sanitized (redacted) copy of the RMP, with the notation “CBI” substituted for the information claimed confidential, except that a generic category or class name shall be substituted for any chemical name or identity claimed confidential; and

5.151.3.3 The document or documents substantiating each claim of confidential business information, as described in Section 5.152.

5.152 Substantiating claims of confidential business information

5.152.1 An owner or operator claiming that information is confidential business information must substantiate that claim by providing documentation that demonstrates that the claim meets the substantivecriteria set forth in 40 CFR 2.301.

5.152.2 Information that is submitted as part of the substantiation may be claimed confidential by marking it as confidential business information. Information not so marked will be treated as public and may be disclosed without notice to the submitter. If information that is submitted as part of the substantiation is claimed confidential, the owner or operator must provide a sanitized and unsanitized version of the substantiation.

5.152.3 The owner, operator, or senior official with management responsibility of the stationary source shall sign a certification that the signer has personally examined the information submitted and that based on inquiry of the persons who compiled the information, the information is true, accurate, and complete, and that those portions of the substantiation claimed as confidential business information would, if disclosed, reveal trade secrets or other confidential business information.

5.153 and 5.154 Reserved

5.155 Executive Summary. The owner or operator shall provide in the RMP an executive summary that includes a brief description of the following elements:

5.155.1 The accidental release prevention and emergency response policies at the stationary source;

5.155.2 The stationary source and regulated substances handled;

5.155.3 The general accidental release prevention program and chemical-specific prevention steps;

5.155.4 The five-year accident history;

5.155.5 The emergency response program; and

5.155.6 Planned changes to improve safety.

5.156 though 5.159 Reserved

5.160 Registration

5.160.1 The owner or operator shall complete a single registration form and include it in the RMP. The form shall cover all regulated substances handled in covered processes.

5.160.2 The registration shall include the following data:

5.160.2.1 Stationary source name, street, city, county, state, zip code, latitude, and longitude, method for obtaining latitude and longitude, and description of location that latitude and longitude represent;

5.160.2.2 The stationary source Dun and Bradstreet number;

5.160.2.3 Name and Dun and Bradstreet number of the corporate parent company;

5.160.2.4 The name, telephone number, and mailing address of the owner or operator;

5.160.2.5 The name and title of the person or position with overall responsibility for RMP elements and implementation, and (optional) e-mail address for that person or position;

5.160.2.6 The name, title, telephone number, and 24-hour telephone number and as of June 21, 2004, the e-mail address (if any e-mail address exists) of the emergency contact;

5.160.2.7 For each covered process, the name and CAS number of each regulated substance held above the threshold quantity in the process, the maximum quantity of each regulated substance or mixture in the process (in pounds) to two significant digits, the five- or six-digit NAICS code that most closely corresponds to the process, and the Program level of the process;

5.160.2.8 The stationary source EPA identifier;

5.160.2.9 The number of full-time employees at the stationary source;

5.160.2.10 Whether the stationary source is subject to 29 CFR 1910.119 dated July 1, 1997;

5.160.2.11 Whether the stationary source is subject to 40 CFR part 355 dated July 1, 1997;

5.160.2.12 If the stationary source has a CAA Title V operating permit, the permit number; and

5.160.2.13 The date of the last safety inspection of the stationary source by a Federal, state, or local government agency and the identity of the inspecting entity.

5.160.2.14 As of June 21, 2004, the name, the mailing address, and the telephone number of the contractor who prepared the RMP (if any);

5.160.2.15 Source of Parent Company E-mail Address (Optional);

5.160.2.16 Source Homepage address (Optional);

5.160.2.17 Phone number at the source for public inquiries (Optional);

5.160.2.18 Local Emergency Planning Committee (Optional);

5.160.2.19 OSHA Voluntary Protection Program status (Optional).

5.160.2.20 As of June 21, 2004, the type of and reason for any changes being made to a previously submitted RMP; the types of changes to RMP are categorized as follows:

5.160.2.20.1 Updates and re-submissions required under 5.190.2;

5.160.2.20.2 Corrections under 5.195 or for purposes of correcting minor clerical errors, updating administrative information, providing missing data elements or reflecting facility ownership changes, and which do not require an update and re-submission as specified in 5.190.2;

5.160.2.20.3 De-registrations required under 5.190.3; and

5.160.2.20.4 Withdrawals of an RMP for any facility that was erroneously considered subject to this Section 5 of this Regulation.

5.161 through 5.164 Reserved

5.165 Off-site Consequence Analysis

5.165.1 The owner or operator shall submit in the RMP information:

5.165.1.1 One worst-case release scenario for each Program 1 process; and

5.165.1.2 For Program 2 and 3 processes, one worst-case release scenario to represent all regulated toxic substances held above the threshold quantity and one worst-case release scenario to represent all regulated flammable substances held above the threshold quantity. If additional worst-case scenarios for toxics or flammables are required by Section 5.25.1.2.3, the owner or operator shall submit the same information on the additional scenario(s). The owner or operator of Program 2 and 3 processes shall also submit information on one alternative release scenario for each regulated toxic substance held above the threshold quantity and one alternative release scenario to represent all regulated flammable substances held above the threshold quantity.

5.165.2 The owner or operator shall submit the following data:

5.165.2.1 Chemical name;

5.165.2.2 Percentage weight of the chemical in a liquid mixture (toxics only);

5.165.2.3 Physical state (toxics only);

5.165.2.4 Basis of results (give model name if used);

5.165.2.5 Scenario (explosion, fire, toxic gas release, or liquid spill and vaporization);

5.165.2.6 Quantity released in pounds;

5.165.2.7 Release rate;

5.165.2.8 Release duration;

5.165.2.9 Wind speed and atmospheric stability class (toxics only);

5.165.2.10 Topography (toxics only);

5.165.2.11 Distance to endpoint;

5.165.2.12 Public and environmental receptors within the distance;

5.165.2.13 Passive mitigation considered; and

5.165.2.14 Active mitigation considered (alternative releases only);

5.166 and 5.167 Reserved

5.168 Five-year Accident History. The owner or operator shall submit in the RMP the information provided in Section 5.42.2 on each accident covered by Section 5.42.1.

5.169 Reserved

5.170 Prevention Program/Program 2

5.170.1 For each Program 2 process, the owner or operator shall provide in the RMP the information indicated in paragraphs 5.170.2 through 5.170.11 of this section. If the same information applies to more than one covered process, the owner or operator may provide the information only once, but shall indicate to which processes the information applies.

5.170.2 The five- or six digit NAICS code that most closely corresponds to the process.

5.170.3 The name(s) of the chemical(s) covered.

5.170.4 The date of the most recent review or revision of the safety information and a list of Federal or state regulations or industry-specific design codes and standards used to demonstrate compliance with the safety information requirement.

5.170.5 The date of completion of the most recent hazard review or update.

5.170.5.1 The expected date of completion of any changes resulting from the hazard review;

5.170.5.2 Major hazards identified;

5.170.5.3 Process controls in use;

5.170.5.4 Mitigation systems in use;

5.170.5.5 Monitoring and detection systems in use; and

5.170.5.6 Changes since the last hazard review.

5.170.6 The date of the most recent review or revision of operating procedures.

5.170.7 The date of the most recent review or revision of training programs;

5.170.7.1 The type of training provided-classroom, classroom plus on the job, on the job; and

5.170.7.2 The type of competency testing used.

5.170.8 The date of the most recent review or revision of maintenance procedures and the date of the most recent equipment inspection or test and the equipment inspected or tested.

5.170.9 The date of the most recent compliance audit and the expected date of completion of any changes resulting from the compliance audit.

5.170.10 The date of the most recent incident investigation and the expected date of completion of any changes resulting from the investigation.

5.170.11 The date of the most recent change that triggered a review or revision of safety information, the hazard review, operating or maintenance procedures, or training.

5.171 through 5.174Reserved

5.175 Prevention Program/Program 3

5.175.1 For each Program 3 process, the owner or operator shall provide the information indicated in paragraphs 5.175.2 through 5.175.16 of this section. If the same information applies to more than one covered process, the owner or operator may provide the information only once, but shall indicate to which processes the information applies.

5.175.2 The five- or six-digit NAICS code that most closely corresponds to the process.

5.175.3 The name(s) of the substance(s) covered.

5.175.4 The date on which the safety information was last reviewed or revised.

5.175.5 The date of completion of the most recent PHA or update and the technique used.

5.175.5.1 The expected date of completion of any changes resulting from the PHA;

5.175.5.2 Major hazards identified;

5.175.5.3 Process controls in use;

5.175.5.4 Mitigation systems in use;

5.175.5.5 Monitoring and detection systems in use; and

5.175.5.6 Changes since the last PHA.

5.175.6 The date of the most recent review or revision of operating procedures.

5.175.7 The date of the most recent review or revision of training programs;

5.175.7.1 The type of training provided -classroom, classroom plus on the job, on the job; and

5.175.7.2 The type of competency testing used.

5.175.8 The date of the most recent review or revision of maintenance procedures and the date of the most recent equipment inspection or test and the equipment inspected or tested.

5.175.9 The date of the most recent change that triggered management of change procedures and the date of the most recent review or revision of management of change procedures.

5.175.10 The date of the most recent pre-startup review.

5.175.11 The date of the most recent compliance audit and the expected date of completion of any changes resulting from the compliance audit;

5.175.12 The date of the most recent incident investigation and the expected date of completion of any changes resulting from the investigation;

5.175.13 The date of the most recent review or revision of employee participation plans;

5.175.14 The date of the most recent review or revision of hot work permit procedures;

5.175.15 The date of the most recent review or revision of contractor safety procedures; and

5.175.16 The date of the most recent evaluation of contractor safety performance.

5.176 through 5.179 Reserved

5.180 Emergency Response Program

5.180.1 The owner or operator shall provide in the RMP the following information:

5.180.1.1 Do you have a written emergency response plan?

5.180.1.2 Does the plan include specific actions to be taken in response to an accidental releases of a regulated substance?

5.180.1.3 Does the plan include procedures for informing the public and local agencies responsible for responding to accidental releases?

5.180.1.4 Does the plan include information on emergency health care?

5.180.1.5 The date of the most recent review or update of the emergency response plan;

5.180.1.6 The date of the most recent emergency response training for employees.

5.180.2 The owner or operator shall provide the name and telephone number of the local agency with which emergency response activities and the emergency response plan is coordinated.

5.180.3 The owner or operator shall list other Federal or state emergency plan requirements to which the stationary source is subject.

5.181 through 5.184 Reserved

5.185 Certification

5.185.1 For Program 1 processes, the owner or operator shall submit in the RMP the certification statement provided in Section 5.12.2.4.

5.185.2 For all other covered processes, the owner or operator shall submit in the RMP a single certification that, to the best of the signer's knowledge, information, and belief formed after reasonable inquiry, the information submitted is true, accurate, and complete.

5.186 through 5.189 Reserved

5.190 Updates

5.190.1 The owner or operator shall review and update the RMP as specified in (b) of this section and submit it in ~~a~~ the method and format to a central point specified by EPA as of the date of submission.~~-~~

5.190.2 The owner or operator of a stationary source shall revise and update the RMP submitted under 5.150 as follows:

5.190.2.1 At least once every five years from the date of its initial submission or most recent update required by paragraphs 5.190.2.2 through 5.190.2.7 of this section, whichever is later; For purposes of determining the date of initial submissions, RMP's submitted before June 21, 1999 are considered to have been submitted on that date.

5.190.2.2 No later than three years after a newly regulated substance is first listed by EPA;

5.190.2.3 No later than the date on which a new regulated substance is first present in an already covered process above a threshold quantity;

5.190.2.4 No later than the date on which a regulated substance is first present above a threshold quantity in a new process;

5.190.2.5 Within six months of a change that requires a revised PHA or hazard review;

5.190.2.6 Within six months of a change that requires a revised off-site consequence analysis as provided in 5.36; and

5.190.2.7 Within six months of a change that alters the Program level that applied to any covered process.

5.190.3 If a stationary source is no longer subject to this part, the owner or operator shall submit a de-registration to EPA within six months indicating that the stationary source is no longer covered.

5.191 through 5.194 Reserved

5.195 Required corrections. The owner or operator of a stationary source for which a RMP was submitted shall correct the RMP as follows:

5.195.1 New accident history information--For any accidental release meeting the five-year accident history reporting criteria of 5.42 and occurring after April 9, 2004, the owner or operator shall submit the data required under 5.168, 5.170.10, and 5.175.12 with respect to that accident within six months of the release or by the time the RMP is updated under 5.190, whichever is earlier.

5.195.2 Emergency contact information--Beginning June 21, 2004, within one month of any change in the emergency contact information required under 5.160.2.6, the owner or operator shall submit a correction of that information.

Subpart H-Other Requirements

5.196 through 5.199 Reserved

5.200 Record Keeping. The owner or operator shall maintain records supporting the implementation of this regulation for five years unless otherwise provided in subpart D.

5.201 through 5.209 Reserved

5.210 Availability of Information to the Public

5.210.1 The data elements of the plan based upon 40 CFR 68.150 through 68.190 dated July 1, 1997 reprinted under Sections 5.150 through 5.190 of subpart G of this regulation shall be available to the public under 42 U.S.C. 7414(c).

5.210.2 The disclosure of classified information by the Department of Defense or other Federal agencies or contractors of such agencies shall be controlled by applicable laws, regulations, or executive orders concerning the release of classified information.

5.211 through 5.214 Reserved

5.215 Permit Content and Designated Agency Requirements

5.215.1 Requirements of this regulation apply to any stationary source subject to Section 5.130 and State of Delaware "Regulations Governing the Control of Air Pollution", Regulation No. 30. The Regulation No. 30 permit for the stationary source shall contain:

5.215.1.1 A statement listing this part as an applicable requirement;

5.215.1.2 Conditions that require the source owner or operator to submit:

5.215.1.2.1 A compliance schedule for meeting the requirements of this regulation by the date provided in Section 5.10.1 or;

5.215.1.2.2 As part of the compliance certification submitted under Regulation 30 Section 6(c)(5), a certification statement that the source is in compliance with all requirements of this regulation, including the registration and submission of the RMP.

5.215.2 The owner or operator shall submit any additional relevant information requested by the Department.

5.215.3 The Department shall, at a minimum:

5.215.3.1 Verify that the source owner or operator has registered and submitted an RMP or a revised plan when required by this part;

5.215.3.2 Verify that the source owner or operator has submitted a source certification or in its absence has submitted a compliance schedule consistent with 5.215.1.2 of this section;

5.215.3.3 For all of the sources subject to this section, use one or more mechanisms such as, but not limited to, a completeness check, source audits, record reviews, or stationary source inspections to ensure that permitted sources are in compliance with the requirements of this part; and

5.215.3.4 Initiate enforcement action based on 5.215.3.1 and 5.215.3.2 of this section as appropriate.

6.0 Additional Delaware Accidental Release Prevention Provisions

This section is not federally enforceable.

6.1 Applicability

6.1.1 Processes at the stationary source with regulated substances present in more than the threshold quantity as defined by Section 5.130 Table 1 or 2 of this regulation are not subject to Sections 6.1.2, 6.5 or 6.6.

6.1.2 Processes with the regulated substance having any potential release quantity equal to or greater than the sufficient quantities as defined in either Section 6.2 Table 4, Section 6.3 Table 5 or Section 6.4 Table 6 and not subject to Section 5.130 [see 6.1.1], shall:

6.1.2.1 Implement the Risk Management Programs described in Section 5 for appropriate program level;

6.1.2.2 Perform a hazard assessment for the Delaware worst-case as required in 6.5;

6.1.2.3 Submit a Risk Management Plan to the Department that complies with 6.6;

6.1.2.4 Implement Section 5 Subpart E Emergency Response;

6.1.2.5 Implement Section 5.200 Record Keeping; and

6.1.2.6 Implement Section 5.15 Management.

6.1.3 Processes in which ammonia is used as an agricultural nutrient, when held by farmers, is exempt from all provisions of this regulation.

6.2 Additional Delaware Regulated Toxic Substances. Table 4 lists the extremely toxic substances and the sufficient quantities at a distance of 100 meters in pounds per hour that are regulated by the State of Delaware only.

6.2.1 Regulated Delaware Toxic Substances and their Sufficient Quantities in pounds per hour at 100 meters.

Note: T=EPA listed toxic F= EPA listed flammable

Table 4: Regulated Delaware Toxic Substances and Sufficient Quantities

Chemical Name	CAS #	Sufficient Quantity (lbs/hr)	EPA Listed
Acrolein	107-02-8	150	T
Acrylyl chloride	814-68-6	200	T
Allylamine	107-11-9	1500	T
Arsine	7784-42-1	100	T
Bis (chloromethyl ether)	542-88-1	50	T
Boron trichloride	10294-34-5	2100	T
Boron trifluoride	7637-07-2	2000	T
Bromine pentafluoride	7789-30-2	1600	
Bromine	7726-95-6	700	T
Bromine chloride	13863-41-7	1000	
Carbon disulfide (Liquid)	75-15-0	3500	
Carbonyl fluoride	353-58-4	2100	
Chlorine	7782-50-5	1300	T
Chlorine dioxide	10049-04-4	200	T

Chlorine pentafluoride	13637-63-3	700	
Chlorine trifluoride	7790-91-2	1700	
Chloromethyl methyl ether	107-30-2	700	T
Chloropicrin	76-06-2	200	
Cyanogen	460-19-5	1600	F
Cyanogen chloride	506-77-4	300	T
Cyanuric fluoride	675-14-9	40	
Diazomethane	334-88-3	400	
Diborane	19287-45-7	80	T
Dichloroacetylene	7572-29-4	200	
Dichlorosilane	4109-96-0	2500	F
Ethylene fluorohydrin	371-62-8	20	
Ethyleneinine	151-56-4	1000	T
Fluorine	7782-41-4	600	T
Formaldehyde	50-00-0	700	T
Furan	110-00-9	300	T
Hexafluoroacetone	684-16-2	7500	
Hexafluoroacetone	648-16-2	6000	
Hydrogen bromide	10035-10-6	3700	
Hydrogen chloride (anhydrous)	7647-01-0	5000	T
Hydrogen cyanide	74-90-8	600	T
Hydrogen fluoride	7664-39-3	900	T
Hydrogen selenide	7783-07-5	150	T
Hydrogen sulfide	7783-06-4	3100	T
Iron pentacarbonyl	13463-40-6	200	T
Isopropyl formate	625-55-8	300	
Isopropylamine	75-35-1	4000	
Ketene	463-51-4	70	
Methacryloyl chloride	920-46-7	150	
Methacryloyloxethyl isocyanate	30674-00-7	60	
Methane sulfenyl choride trichloro-	594-42-3	200	
Methyl acrylonitrile	126-98-7	200	T
Methyl bromide	74-83-9	17000	
Methyl chloroformate	79-22-1	400	T
Methyl fluoroacetate	453-18-9	60	
Methyl fluorosulfate	421-20-5	50	

Methyl hydrazine	60-34-4	90	T
Methyl isocyanate	624-83-9	80	T
Methyl mercaptan	74-93-1	4300	T
Methyl vinyl ketone	78-94-4	15	
Methyltrichlorosilane	75-79-6	2000	T
Nickel carbonyl	13463-39-3	150	
Nitric acid (94.5 wt% or greater)	7697-37-2	300	
Nitric oxide	10102-43-9	200 as NO_2	
Nitrogen oxides	10102-44-0	200 as NO_2	
Oleum (65 wt% or greater)	8014-95-7	700 as SO_3	
Osmium tetroxide	20816-12-0	20	
Oxygen difluoride	7783-41-7	10	
Ozone	10028-15-6	20	
Pentaborane	19624-22-7	20	
Perchloromethyl mercaptan	594-42-3	150	T
Perchloryl fluoride	7616-94-6	3600	
Phosgene	75-44-5	90	T
Phosphine	7803-51-2	150	T
Phosphorous trichloride	7719-12-2	1900	T
Propargyl bromide	106-96-7	10	
Sarin	107-44-8	15	
Selenium hexafluoride	7783-79-1	900	
Stibine	7803-52-3	170	
Sulfur dioxide (liquid)	7446-09-5	900	T
Sulfur pentafluoride	5714-22-7	250	
Sulfur tetrafluoride	7783-60-0	200	T
Sulfur trioxide	7446-11-9	700	T
Tellurium hexafluoride	7783-80-4	200	
Tetrafluorohydrazine	10086-47-2	4700	
Thionyl chloride	7719-09-7	1100	
Trichloro (chloromethyl) silane	1558-25-4	70	
Trichloro (dichlorophenyl) silane	27137-85-5	1800	
Trichlorosilane	10025-78-2	3300	F
Trimethoxysilane	2487-98-3	600	

6.2.2 Calculation of Sufficient Quantity for Toxic Mixtures .

6.2.2.1 To determine whether a mixture containing an regulated substance is to be regulated, the owner or operator shall calculate the substance hazard index (SHI) as follows:

$$SHI_{mixture} = SHI_{pure\ regulated\ substance} \times \text{Mole fraction of regulated substance in mixture}$$

As an alternative, the owner or operator may calculate the SHI of the mixture using equilibrium vapor pressure for the pure regulated substance above the mixture at 20×C.

6.2.2.2 If the SHI calculated for the mixture is $8000 then the mixture shall be subject to the provision of this regulation.

6.2.2.3 The sufficient quantity for the mixture shall be calculated as follows:

6.2.3 Calculation of Potential Release Quantity (PRQ). Owners or operators with a regulated toxic substance present in a process that is equal to or greater than the sufficient quantity shall calculate the maximum PRQ in accordance with the provisions of paragraph 6.5.2.8.

6.2.4 Applicability. If any potential release quantity equals or exceeds the sufficient quantity, then the owner or operator shall develop and implement a risk management program in accordance with Section 6.1.2.

6.3 Additional Delaware Regulated Flammable and Combustible Substances

6.3.1 Flammable and Combustible liquids. The following flammable and combustible liquids and gases that are handled, used, produced, or stored equal to or greater than their sufficient quantities shall be regulated.

6.3.1.1 All flammable gases (a regulated flammable substance that exists as a gas at standard pressure and temperature).

6.3.1.2 Flammable and combustible liquids that are held at or above their atmospheric boiling point (benzene, gasoline and hexane have been included in Table 5 as examples of these higher boiling combustible substances which can be regulated if enough is present to form a vapor cloud greater than the sufficient quantity); and

6.3.1.3 Flammable and combustible liquids which are held below ambient temperatures through refrigeration, but whose vapor pressure at 86×F is greater than one atmosphere.

6.3.2 Flammable and combustible liquid exemption. Flammable and combustible liquids handled, used, produced or stored in atmospheric tanks below their atmospheric boiling point without the benefit of chilling or refrigeration are not regulated herein.

6.3.3 Partial list of flammable and combustible liquids. Table 5 lists some of the most common flammable and combustible substances and their sufficient quantity release rates at a distance of 100 meters in pounds per minute.

Table 5: Partial List of Delaware Regulated Flammable Substances

Chemical Name	CAS #	Boiling Point (EF)	Sufficient Quantity (lbs/ min)	EPA Listed
Acetaldehyde	75-07-0	69	4100	F
Acetylene	74-86-2	-118	1900	F
Ammonia	7664-41-7	-28	6700	T
Benzene	71-43-2	176	2600	
1,3 Butadiene	106-99-0	24	2800	F
Butane	106-97-8	31	3000	F
Butene	25167-67-3	21	2800	F
1-Butene	106-98-9	37.8	2700	F
2-Butene	107-01-7	37.8	2700	F
2-Butene trans	624-64-6	34	2800	F
2-Butene cis	590-18-1	38.7	2700	F
Carbon monoxide	630-08-0	-314	10000	
2-Chloropropylene [1-Propene, 2-chloro]	557-98-2	73	8000	F
Cyclopropane	75-19-4	-29	2800	F
Difluoroethane [Ethane, 1,1-difluoro-]	75-37-6	-61	7300	F
Dimethylamine	124-40-3	45	3000	F
Dimethylpropane [Propane, 2,2-dimethyl-]	463-82-1	49	2900	F
Ethane	74-84-0	-128	2800	F
Ethyl acetylene	107-00-6	47	3000	F
Ethyamine	75-04-7	62	4000	F
Ethylene	74-85-1	-155	2300	F
Ethylene oxide	75-21-8	51	3300	T
Ethyl chloride	75-00-3	54	4600	F
Gasoline	8006-61-9	100-400	3300	
Hexane	100-64-3	156	2800	
Hydrogen	1333-74-0	-422	300	F
Isobutane [Propane, 2-methyl]	75-28-5	11	2900	F
Isopentane [Butane, 2-methyl]	78-78-4	82	2900	F
Methane	74-82-8	-259	2500	F
Methylamine	74-89-5	21	3900	F

3-Methyl-1-butene	563-45-1	68	3000	F
Methyl Ether	115-10-6	-11	4200	F
2-Methylpropene [1-Propene, 2-metyh-]	115-11-7	20	2900	F
1.3 Pentadinene	504-60-9	-45	2900	F
Propane	74-98-6	-44	2700	F
Propylene	115-07-1	-53	2600	F
1-Propyne	74-99-7	-10	2200	F
Silane	7803-62-5	-169	2200	F
Tetramethylsilane	75-76-3	80	3600	F
Trimethylamine	75-50-3	38	3000	F
Vinyl chloride	75-35-4	7	5300	F
Vinyl fluoride	75-02-5	-97.5	6000	F
Vinyl methyl ether	107-25-5	43	4100	F

6.3.4 Calculation of the sufficient quantity. The sufficient quantity release rate for all flammable and combustible substances at a distance of 100 meters from the stationary source boundary shall be calculated using the following formula and by using propane as the release rate reference substance:

$$SQRR_X = SQRR_P \left(\frac{MW_X}{MW_P}\right)^{0.81} \left(\frac{LFL_X}{LFL_P}\right)^{0.72} \left(\frac{BP_P + 294}{BP_X + 294}\right)^{0.33} \left(\frac{HC_P}{HC_X}\right)^{0.20}$$

$SQRR_x$ = Sufficient Quantity Release Rate for Substance x in lbs vapor/min
$SQRR_p$ = Sufficient Quantity Release Rate for Propane in lbs vapor/min
MW_x = Molecular weight of Substance X
MW_p = Molecular weight of Propane = 44
LFL_x = Lower Flammable Limit of Substance X
LFL_p = Lower Flammable Limit of Substance Propane = 2.1%
BP_x = Boiling Point of Substance X in ×K
BP_p = Boiling Point of Propane in ×K = 229EK
HC_p = Heat of Combustion of Propane in Btu/lb = 19,944 Btu/lb
HC_x = Heat of Combustion of Substance X in Btu/lb

6.3.5 Calculation of Potential Release Quantity . Owners or operators with a regulated flammable or combustible substance present in a process that is equal to or greater than the sufficient quantity shall calculate the maximum PRQ in accordance with the provisions of paragraph 6.5.2.8.

6.3.6 Applicability. If any potential release quantity equals or exceeds the sufficient quantity, then the owner or operator shall develop and implement a risk management program in accordance with Section 6.1.2.

6.4 Delaware Regulated Explosive Substances

6.4.1 Delaware regulated explosive substances are listed in Table 6 with their sufficient quantities in pounds at 100 meters.

Table 6: Delaware Regulated Explosive Substances

Chemical Name	CAS #	Sufficient Quantity (lbs)	EPA Listed
Alkylaluminums (as tri-n-butylaluminum)	1116-70-7	4700	
Ammonium perchlorate	7790-98-9	6900	
Ammonium nitrate	6484-52-2	6200	
Ammonium permanganate	13446-10-1	6900	
Bromine trifluoride	7787-71-5	15000	
3-Bromopropyne	106-96-7	6100	
Butyl Hydroperoxide (tertiary)	75-91-2	3600	
Butyl Perbenzoate (tertiary)	614-45-9	6300	
Butyl Peroxyacetate (tertiary)	107-71-1	4300	
Butyl Peroxypivalate (tertiary)	927-07-1	8600	
Cellulose nitrate (not explosive grade)	9004-70-0	2300	
Chlorodiethylaluminum	96-10-6	4100	
1-Chloro-2,4-dinitrobenzene	97-00-7	3000	
Cumene hydroperoxide	80-15-9	4400	
Diacetyl peroxide (55% solution)	110-22-5	4200	
Dibenzoyl peroxide	94-36-0	6100	
Dibutyl peroxide (Tertiary)	110-05-4	4700	
Diethylzinc	557-20-0	7700	
Diisopropyl peroxydicarbonate	105-64-6	5200	
Dilauroyl peroxide	105-74-8	5800	
2, 4-Dinitroaniline	97-02-9	3000	
1,2-Dinitrobenzene, ortho	528-29-0	2700	
1,3-Dinitrobenzene, meta	99-65-0	2700	
1,4-Dinitrobenzene, para	100-25-4	2700	
2,3-Dinitrotoluene	602-01-7	3100	
2,4-Dinitrotoluene	121-14-2	3100	
2,5-Dinitrotoluene	619-15-8	3100	
2,6-Dinitrotoluene	606-20-2	3100	
3,4-Dinitrotoluene	610-39-9	3100	
3,5-Dinitrotoluene	618-85-9	3100	

Ethyl methyl ketone peroxide	19393-67-0	2700	
Ethyl nitrite	109-95-5	2800	F
Hydrogen peroxide (52% by weight or greater)	7722-84-1	5700	
Hydroxylamine	7803-49-8	2500	
2-Nitroaniline, ortho	88-74-4	3800	
3-Nitroaniline, meta	99-09-2	3800	
4-Nitroaniline, para	100-01-6	3800	
Nitroethane	79-24-3	2800	
Nitromethane	75-52-5	2300	
Perchloric acid	7601-90-3	12000	
Peroxyacetic Acid (60% acetic acid solution)	79-21-0	3200	T
Picric acid	88-89-1	2500	
Propyl Nitrate (normal)	627-13-4	2700	
Tetrafluoroethylene monomer	116-14-3	7500	F
1,2,4-Trinitrobenzene		2300	
2,3,4-Trinitrotoluene	602-29-3	2600	
2,3,5-Trinitrotoluene		2600	
2,3,6-Trinitrotoluene		2600	
2,4,5-Trinitrotoluene	610-25-3	2600	
2,4,6-Trinitrotoluene	118-96-7	2600	
3,4,5-Trinitrotoluene		2600	

* When data was not available, TNT equivalents assumed to be 1:1. Processes subject to this section may use actual data in calculating sufficient quantity.

6.4.2 Calculation of Potential Release Quantity. The potential release quantity for explosive substances is the sum of all physical quantities which are used, handled, produced, or stored in the process and which are neither separated by a distance of 100 meters nor are barricaded as defined in the explanatory notes for NFPA 495, Table 6-4.1.

6.4.3 Applicability. If any potential release quantity equals or exceeds the sufficient quantity, then the owner or operator shall develop and implement a risk management program in accordance with Section 6.1.2.

6.5 Delaware Hazard Assessment

6.5.1 The Delaware Hazard Assessment. The owner or operator of a stationary source subject to Section 6.1.2 shall prepare a Delaware worst-case release scenario analysis as provided in Section 6.5.2 of this section and complete the five-year accident history as provided in Section 5.42. The owner or operator of a Program 2 process must comply with Section 5.0 Subpart C and the owner or operator of a Program 3 process must comply with Section 5.0 Subpart D. The Delaware hazard assessment shall include:

6.5.1.1 An estimate of the potential release quantity;

6.5.1.2 A dispersion analysis in the case the scenario is for a regulated toxic, flammable or combustible substance;

6.5.1.3 An overpressure grid in the case the scenario is for a regulated explosive substance; and

6.5.1.4 A consequence analysis of the effects on surrounding populations.

6.5.2 Off-site consequence analysis parameters.

6.5.2.1 Endpoints. For analyses of off-site consequences, the following endpoints shall be used:

6.5.2.1.1 Toxic substances. The toxic endpoints that shall be used in determining the distance to endpoint are as follows and the order that follows shall determine which endpoint should be used if a substance is listed on several of the lists named below:

6.5.2.1.1.1 AIHA 1997, ERPG-3 will be considered before;

6.5.2.1.1.2 Acute Toxicities from New Jersey "Toxic Catastrophe Prevention Act" (TCPA) which will be considered before;

6.5.2.1.1.3 Levels of concern from EPA's "Technical Guidance for Hazard Analysis: Emergency Planning for Extremely Hazardous Substances, December 1987" also known as the *Green Book*.

6.5.2.1.2 Flammable substances. The endpoint for regulated flammable and combustible substances shall be the radiant heat necessary to create second degree burns from a vapor cloud fire 100 meters from the source of the release or 1020.48 kj/sec m^2. The dispersion analysis shall account for movement of the vapor cloud under average Delaware weather conditions prior to ignition.

6.5.2.1.3 Explosive substances. The endpoint shall be the amount of overpressure necessary to cause eardrum rupture 100 meters from the release or 2.3 psi.

6.5.2.2 Wind speed/atmospheric stability class. For the Delaware worst-case release analysis, the owner or operator shall use average Delaware weather conditions consisting of a wind speed of 4.3 meters per second and atmospheric stability class of D.

6.5.2.3 Ambient temperature/humidity. For worst-case release analysis of a regulated toxic substance, the owner or operator shall use 86 EF. An owner or operator may use 25 EC when using the RMP Off-site Consequence Analysis Guidance.

6.5.2.4 Height of release. The worst-case release of a regulated toxic substance shall be analyzed assuming a ground level (0 feet) release.

6.5.2.5 Surface roughness. The owner or operator shall use either urban or rural topography, as appropriate. Urban means that there are many obstacles in the immediate area; obstacles include buildings or trees. Rural means there are no buildings in the immediate area and the terrain is generally flat and unobstructed.

6.5.2.6 Dense or neutrally buoyant gases. The owner or operator shall ensure that tables or models used for dispersion analysis of regulated toxic substances appropriately account for gas density.

6.5.2.7 Temperature of released substance. For worst case, liquids other than gases liquified by refrigeration only shall be considered to be released at the highest daily maximum temperature, based on data for the previous three years appropriate for the stationary source, or at process temperature, whichever is higher.

6.5.2.8 Maximum potential release rates for the Delaware worst-case scenario shall be calculated considering the following:

6.5.2.8.1 Catastrophic line failure (flow from both ends);

6.5.2.8.2 Catastrophic hose failure (flow from both ends);

6.5.2.8.3 Exposure of vessels and equipment to fire;

6.5.2.8.4 Venting of pressure relief valve at relief system design basis; and

6.5.2.8.5 Failure of mitigating systems such as flares, scrubbers, isolation valves, excess flow valves, and cooling systems.

6.5.2.8.6 Graphs and calculations were developed and were included in the "Background Document, September 25, 1989". These calculation and graphs (reproduced in Appendix A) provide one method of calculating the maximum potential release quantity. The method of calculation must be approved by the Department and submitted with Delaware RMP, if different from the approach described below.

6.5.2.8.6.1 To calculate the potential release quantity of a gas (not a flashing liquid), the following equation may be used to determine the release rate:

$$RR = \frac{(RR_R)(OED)^2}{(OED_R)^2}\left[\frac{(MW)(P)(528)}{(16)(P_R)(T+460)}\right]^{0.5}$$

where:

RR = the release rate of the actual regulated substance in pounds/min.

RR_R = a the release rate for methane estimated in lbs/min from Appendix A Graph 1 or 2;

OED = the opening equivalent diameter in inches;

MW = the molecular weight of the actual substance released;

P = the pressure inside the vessel or pipe prior to the release in psig;

OED_R = the size of reference opening equivalent diameter from Appendix A Graph 1 or 2;

P_R = the pressure of methane curve from Appendix A Graph 1 or 2 nearest the pressure of the pressure of the actual substance; and

T = temperature of the substance prior to the release in EF;

- For regulated toxic substances the maximum potential release quantity is equal to RR X 60 minutes;
- For regulated flammable and combustible substances the maximum potential release quantity is equal to RR if the release is sustainable for a minimum of 35 seconds. Otherwise it is the actual quantity; and
- A process becomes a covered process and is subject to Section 6.1.2 when the maximum potential release quantity is greater than or equal to the sufficient quantity.

6.5.2.8.6.2 To calculate the potential release quantity for a flashing liquid release, the following equation may used to determine the release rate:

$$RR = \frac{(RR_R)(OED)^2}{(OED_R)^2}\left[\frac{(Den)(P)}{(39.32)(P_R)}\right]^{0.5}$$

where:

RR = the release rate of the actual regulated substance in pounds/min.

RR_R = the release rate for propane estimated in lbs/min from Appendix A Graph 3 or 4;

OED = the opening equivalent diameter in inches;

Den = the liquid density of the actual substance released prior to the release in lb/ft^3;

P = the pressure inside the vessel prior to the release in psig;

OED_R = the size of reference opening equivalent diameter from Appendix A Graph 3 or 4; and

P_R = the pressure of propane curve from Appendix A Graph 3 or 4 nearest the pressure of the pressure of the actual substance.

- For flashing liquids whose boiling points are greater than 5 EC, a pool of cold liquid can form when the storage area is diked. The release rate is used to calculate the size of the pool that is formed by the substance being released. The potential release quantity is calculated based on the surface area of the pool in square feet multiplied by the pool vaporization factor from Appendix A Graph 5. For situations when there is no dike or for flashing liquids whose boiling points are less than or equal to 5 EC, assume that the liquid volatilizes immediately upon release and that RR is the maximum potential release quantity.

- For regulated toxic substances the maximum potential release quantity is equal to RR X 60 minutes;
- For regulated flammable and combustible substances the maximum potential release quantity is equal to RR if the release is sustainable for a minimum of 35 seconds. Otherwise it is the actual quantity; and
- A process becomes a covered process and is subject to Section 6.1.2 when the maximum potential release quantity is greater than or equal to the sufficient quantity.

6.5.2.8.6.3 To calculate the potential release quantity for a liquid release (not a flashing liquid), the equation below may be used to determine the release rate:

$$RR = \frac{(RR_R)(OED)^2}{(OED_R)^2}\left[\frac{(Den)(P)}{(39.32)(P_R)}\right]^{0.5}$$

where:

RR = the release rate of the actual regulated substance in pounds/min.

RR_R = the release rate for gasoline estimated in lbs/min from Appendix A Graph 6 or 7;

OED = the opening equivalent diameter in inches;

Den = the liquid density of the actual substance released prior to the release;

P = the pressure inside the vessel prior to the release in psig;

OED_R = the size of reference opening equivalent diameter from Appendix A Graph 6 or 7; and

P_R = the pressure of gasoline curve from Appendix A Graph 6 or 7 nearest the pressure of the pressure of the actual substance.

The release rate is used to calculate the size of the pool that is formed by the substance being released. The potential release quantity is calculated based on the surface area of the pool in square feet multiplied by the pool vaporization factor from Appendix A Graph 5.

6.5.2.8.6.4 To determine the potential release quantity, RR calculated above must be doubled if the release is from a pipe or hose where it is possible to get flow from both ends of the breakage; otherwise the PRQ = RR.

- For combustible liquids, a pool of liquid can form when the storage area is diked. The release rate is used to calculate the size of the pool that is formed by the substance being released. The potential release quantity is calculated based on the surface area of the pool in square feet multiplied by the pool vaporization factor from Appendix A Graph 5. For situations when there is no

dike, assume that the pool depth is 1 centimeter.

- For regulated toxic substances the maximum potential release quantity is equal to RR X 60 minutes;
- For regulated flammable and combustible substances the maximum potential release quantity is equal to the vapor release rate if the release is sustainable for a minimum of 35 seconds. Otherwise it is the actual quantity; and
- A process becomes a covered process and is subject to 6.1.2 when the maximum potential release quantity is greater than or equal to the sufficient quantity.

6.5.2.9 For explosive substances, the potential release quantity is the sum of all physical quantities which are used, handled, produced, or stored in the process. Processes separated by a distance of 100 meters or barricaded as defined in NFPA 495, Explanatory notes for Table 6-4.1 “American Table of Distances”, shall be considered multiple processes. One method for determining the distance to endpoint for an explosive substance that may be used is the TNT equivalent method such as:

$$D = K W^{1/3}$$

where:

D is the distance to endpoint for a given overpressure;

W is the mass of TNT detonated, and

K is the scaled distance or 24 for 2.3 psi overpressure.

To approximate W, the weight of regulated substance is multiplied by a yield factor (3% to 10%) and is multiplied by the ratio of the heat of combustion of the regulated substance to the heat of combustion of TNT.

6.5.3 Delaware Worst-case release scenario analysis.

6.5.3.1 The owner or operator shall analyze and report in the Delaware Risk Management Plan:

6.5.3.1.1 For Program 1 processes, one worst-case release scenario for each Program 1 process;

6.5.3.1.2 For Program 2 and 3 processes:

6.5.3.1.2.1 One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint resulting from an accidental release of regulated toxic substances from covered processes under worst-case conditions defined in Section 6.5.2; and

6.5.3.1.2.2 One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint defined in Section 6.5.2 resulting from

an accidental release of regulated flammable substances from covered processes under worst-case conditions defined in Section 6.5.2.

6.5.3.1.2.3 One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint defined in Section 6.5.2 resulting from the detonation of the regulated explosive substance from covered processes under worst-case conditions defined in Section 6.5.2.

6.5.3.1.2.4 Additional worst-case release scenarios for a hazard class if a worst-case release from another covered process at the stationary source potentially affects public receptors different from those potentially affected by the worst-case release scenario developed under paragraphs 6.5.3.1.2.1 or 6.5.3.1.2.2 of this section.

6.5.3.2 Parameters to be applied. The owner or operator shall use the parameters defined in Section 6.5.2 to determine distance to the endpoints. The owner or operator may use the methodology provided in the RMP Off-site Consequence Analysis Guidance or any commercially or publicly available air dispersion modeling techniques, provided the techniques account for the modeling conditions and are recognized by industry as applicable as part of current practices. Proprietary models that account for the modeling conditions may be used provided he owner or operator allows the Department access to the model and describes model features and differences from publicly available models to local emergency planners upon request. The owner or operator may also use the following look-up tables to determine the distance to endpoint (where AQ represents the ratio of the actual quantity of a regulated substance contained in a process to the sufficient quantity for that substance):

Table 7: Distance to Endpoint for Delaware Regulated Toxic Substances [1]

AQ/SQ	Distance to Endpoint (meters)	Distance to Endpoint (miles)
1.0	100	0.06
2.0	143.10	0.09
2.5	161.11	0.10
3.0	177.45	0.11
4.0	208.29	0.13
5.0	235.03	0.15
7.5	294.91	0.18
10.0	346.72	0.22
25.0	590.66	0.37
50.0	905.11	0.56

[1]This Table was developed from Section 5.2.2.2 the toxic Distance Multipliers Table II from the “Regulation for the Management of Extremely Hazardous Substances, September 25, 1989.

Table 8: Distance to Endpoint for Delaware Regulated Flammable Substances [2]

AQ/SQ	Distance to Endpoint (meters)	Distance to Endpoint (miles)
1.0	100	0.06
2.0	146.29	0.09
2.5	165.89	0.10
3.0	182.62	0.11
4.0	214.83	0.13
5.0	243.90	0.15
7.5	305.90	0.19
10.0	359.30	0.22
25.0	589.41	0.37
50.0	870.80	0.54

[2]This Table was developed from Section 5.3.3.3 the flammable Distance Multipliers Table IV from the "Regulation for the Management of Extremely Hazardous Substances, September 25, 1989.

Table 9: Distance to Endpoint for Delaware Regulated Explosive Substances [3]

AQ/SQ	Distance to Endpoint (meters)	Distance to Endpoint (miles)
1.0	100	0.06
2.0	121.01	0.08
2.5	131.51	0.08
3.0	142.02	0.09
4.0	156.71	0.10
5.0	167.53	0.10
7.5	194.59	0.12
10.0	213.11	0.13
25.0	291.20	0.18
50.0	366.86	0.22

[3]This Table was adapted from Section 5.4.3.2 the explosive Distance Multipliers Table VI from the "Regulation for the Management of Extremely Hazardous Substances, September 25, 1989.

6.5.3.3 Consideration of passive mitigation. Passive mitigation systems may be considered for the analysis of worst case provided that the mitigation system is capable of withstanding the release event triggering the scenario and would still function as intended.

6.5.3.4 Factors in selecting a worst-case scenario. Notwithstanding the provisions of paragraph 6.5.3.2 of this section, the owner or operator shall select as the worst-case for flammable regulated substances or the worst-case for regulated toxic

substances, a scenario based on the following factors if such a scenario would result in a greater distance to an endpoint defined in Section 6.5.2 beyond the stationary source boundary than the scenario provided under paragraph 6.5.3.2 of this section:

6.5.3.4.1 Smaller quantities handled at higher process temperature or pressure; and

6.5.3.4.2 Proximity to the boundary of the stationary source.

6.5.4 Defining off-site impacts-population.

6.5.4.1 The owner or operator shall estimate in the Delaware Risk Management Plan the population within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in 6.5.2.

6.5.4.2 Population to be defined. Population shall include residential population. The presence of institutions (schools, hospitals, prisons), parks and recreational areas, and major commercial, office, and industrial buildings shall be noted in the RMP.

6.5.4.3 Data sources acceptable. The owner or operator may use the most recent Census data, or other updated information, to estimate the population potentially affected.

6.5.4.4 Level of accuracy. Population shall be estimated to two significant digits or one significant digit if the population is less than 1000.

6.5.5 Defining off-site impacts-environment.

6.5.5.1 The owner or operator shall list in the RMP environmental receptors within a circle with its center at the point of the release and a radius determined by the distance to the endpoint defined in Section 6.5.2 of this part.

6.5.5.2 Data sources acceptable. The owner or operator may rely on information provided on local U.S. Geological Survey maps or on any data source containing U.S.G.S. data to identify environmental receptors.

6.6 Delaware Risk Management Plan

6.6.1 Submission.

6.6.1.1 The owner or operator subject to 6.1.2 shall submit a single Delaware Risk Management Plan that includes the information required by 6.6.2 through 6.6.10 for all covered processes. The Delaware Risk Management Plan shall be submitted on a form provided by the Department to a location specified by the Department prior to June 21, 1999. The Department may establish procedures for the submission of information under this section on electronic media. The submission of information in accordance with such procedures by owners or operators of covered processes shall satisfy the associated requirement to submit the information in a paper format.

6.6.1.2 The owner or operator shall submit the first Delaware Risk Management Plan no later than the latest of the following dates:

6.6.1.2.1 June 21, 1999;

6.6.1.2.2 Six months after the date on which a newly regulated substance is first listed in Section 6; or

6.6.1.2.3 The date on which a regulated substance is first present above a threshold quantity in a process.

6.6.1.2.4 Subsequent submissions of Delaware Risk Management Plans shall be in accordance with Section 6.6.10.

6.6.2 Executive summary. The owner or operator shall provide in the Delaware Risk Management Plan an executive summary that includes a brief description of the process, risk management plan and quantity and size of any storage tanks.

6.6.3 Registration. The owner or operator shall complete a single registration form and include it in the Delaware Risk Management Plan. The form shall cover all regulated substances handled in covered processes.

6.6.4 Off-site consequence analysis.

6.6.4.1 The owner or operator shall submit in the Delaware Risk Management Plan information:

6.6.4.1.1 One Delaware worst-case release scenario for each Program 1 process; and

6.6.4.1.2 For Program 2 and 3 processes, one Delaware worst-case release scenario to represent: all regulated toxic substances with any potential release quantity that is greater than the sufficient quantity; all regulated flammable substances with any potential release quantity that is greater than the sufficient quantity; and all regulated explosive substance with any potential release quantity that is greater than the sufficient quantity.

6.6.4.1.3 If additional Delaware worst-case scenarios for toxics, flammables, or explosives are required by Section 6.5.3.1.2.4, the owner or operator shall submit the same information on the additional scenario(s).

6.6.4.2 The owner or operator shall submit in the Delaware Risk Management Plan the following data:

6.6.4.2.1 Chemical name;

6.6.4.2.2 Physical state (toxics and flammables only);

6.6.4.2.3 Basis of results (give model name if used);

6.6.4.2.4 Scenario (explosion, fire, toxic gas release, or liquid spill and vaporization);

6.6.4.2.5 Quantity released in pounds;

6.6.4.2.6 Release rate (toxics and flammables only);

6.6.4.2.7 Topography (toxics and flammables only);

6.6.4.2.8 Distance to endpoint;

6.6.4.2.9 Public and environmental receptors within the distance; and

6.6.4.2.10 Passive mitigation considered.

6.6.5 Five-year accident history. The owner or operator shall submit in the Delaware Risk Management Plan the information provided in the Delaware Risk Management Plan form on each accident covered that resulted in known on-site or off-site injuries or deaths, evacuations, sheltering in place, on site or offsite property damage or onsite or offsite environmental damage.

6.6.6 Prevention program/Program 2. For each Program 2 process, the owner or operator shall provide in the Delaware Risk Management Plan the information indicated in the Delaware Risk Management Plan form. If the same information applies to more than one covered process, the owner or operator may provide the information only once, but shall indicate to which processes the information applies.

6.6.7 Prevention program/Program 3. For each Program 3 process, the owner or operator shall provide the information indicated in the Delaware Risk Management Plan form. If the same information applies to more than one covered process, the owner or operator may provide the information only once, but shall indicate to which processes the information applies.

6.6.8 Emergency response program. The owner or operator shall provide in the Delaware Risk Management Plan the same information that is described in the Delaware Risk Management Plan form.

6.6.9 Certification.

6.6.9.1 For Program 1 processes, the owner or operator shall submit in the Delaware Risk Management Plan the certification statement provided in the Delaware Risk Management Plan form.

6.6.9.2 For all other covered processes, the owner or operator shall submit in the Delaware Risk Management Plan a single certification that, to the best of the signer's knowledge, information, and belief formed after reasonable inquiry, the information submitted is true, accurate, and complete.

6.6.10 Updates.

6.6.10.1 The owner or operator shall review and update the Delaware Risk Management Plan as specified in paragraph 6.6.10.2 of this section and submit it on a form provided by the Department prior to June 21, 1999.

6.6.10.2 The owner or operator of a covered process shall revise and update the Delaware Risk Management Plan submitted under Section 6.6 within five years of the initial submission or sooner updates as required by the following:

6.6.10.2.1 No later than six months after a newly regulated substance is first listed by the Department;

6.6.10.2.2 No later than the date on which a new regulated substance is first present in an already covered process above a threshold quantity;

6.6.10.2.3 No later than the date on which a regulated substance is present above a threshold quantity in a new process;

6.6.10.2.4 Within six months of a change that requires a revised process hazard assessment or hazard review, and

6.6.10.2.5 Within six months of a change that alters the program level that applied to any covered process.

6.6.10.3 If a covered process is no longer subject to this part, the owner or operator shall submit certification to the Department within six months indicating that the process is no longer covered.

7.0 Inspections

7.1 Minimum Inspection Components. All documentation required by this regulation shall be maintained by the Owner or operator of the stationary source and shall be available on site for review by the Department. At a minimum, inspections of stationary source risk management programs include:

7.1.1 Review of selected risk management program documentation including evidence of the application of engineering and maintenance standards associated with regulated substance;

7.1.2 A physical onsite inspection of equipment associated with regulated substance; and

7.1.3 Interviews of selected stationary source personnel involved with regulated substance.

7.2 Inspection Protocol. The inspection protocol shall consist of:

7.2.1 Appendix A “PSM Audit Guidelines” from the OSHA Compliance Directive CPL 2-2.45A (change-1) dated September 1994,

7.2.2 EPA audit guidance and protocol, and

7.2.3 The compliance of a covered process shall be determined by physical inspections conducted: by trained and tested state personnel or their designated trained and qualified representatives, and by interviews with stationary source personnel.

7.3 Access to Facilities and Records. The Department has the right to enter any stationary source at any time to verify compliance with this regulation. Inspections for the sole purpose of document review shall be scheduled with owner or operator of the stationary source management with reasonable advance notice, and when possible, mutual agreement.

7.4 Findings of Compliance or Noncompliance. The Department shall issue an inspection report detailing the findings of compliance or noncompliance with the risk management program requirements for each inspection. Reports shall contain the Department’s recommendations based on inspection for potential improvements to a facility’s risk management program. Significant items of noncompliance shall be communicated directly to the stationary source management by the Department during an exit interview. Within sixty (60) days after receiving the Department's recommendations, the owner or operator of the stationary source shall notify the Department of changes and additions to improve the risk management program or shall present a remediation plan and schedule for the Department's approval.

7.5 Resolution of Findings of Noncompliance.

7.5.1 If the owner or operator of the stationary source and the Department agree on measures to correct risk management program deficiencies or omissions, the parties may enter into a written agreement.

7.5.2 If the Department and owner or operator of the stationary source fail to agree on improvements to the risk management program following Department notice of noncompliance as provided above and following an administrative hearing with written findings, as provided for in 7 **Del.C**,, Section 7715 and Section 11 of this regulation, the Department shall issue an administrative order requiring correction of risk management program deficiencies including a schedule for corrections as provided for in 7 **Del.C.,** Section 7714.

7.5.3 If a functioning risk management program is lacking and a situation exists which threatens real and imminent jeopardy to the lives and health of persons in the vicinity of the stationary source, the Department shall promptly seek Chancery Court injunctive relief as provided for in 7 **Del.C**., Section 7714.

8.0 Audits

8.1 RMP Audit. In addition to inspections for the purpose of regulatory development and enforcement, the Department shall audit all RMPs submitted pursuant to Section 5, Subpart G and the Delaware risk management plans submitted under Section 6.6 within 12 months of the date that they are received by the Department or posted by EPA.

8.2 Access to Information. The Department shall have access to the stationary source, supporting documentation, and any area where an accidental release could occur.

8.3 Preliminary Audit Determination. Based on the audit, the Department may issue the owner or operator of a stationary source a written preliminary determination of necessary revisions to the stationary source's RMP to ensure that the RMP meets the criteria of Section 5 Subpart G. The preliminary determination shall include an explanation for the basis for the revisions, reflecting industry standards and guidelines (such as AIChE/CCPS guidelines and ASME and API standards) to the extent that such standards and guidelines are applicable, and shall include a timetable for their implementation.

8.4 Written response to a preliminary determination.

8.4.1 The owner or operator shall respond in writing to a preliminary determination made in accordance with 8.3 of this section. The response shall state the owner or operator will implement the revisions contained in the preliminary determination in accordance with the timetable included in the preliminary determination or shall state that the owner or operator rejects the revisions in whole or in part. For each rejected revision, the owner or operator shall explain the basis for rejecting such revision. Such explanation may include substitute revisions.

8.4.2 The written response under 8.4.1 of this section shall be received by the Department within 60 days of the issue of the preliminary determination or a shorter period of time as the Department specifies in the preliminary determination as necessary to protect public health and the environment. Prior to the written response being due and upon written request from the owner or operator, the Department may provide in writing additional time for the response to be received.

8.5 Final Audit Determination. After providing the owner or operator an opportunity to respond under 8.4 of this section, the Department may issue the owner or operator a written final determination of necessary revisions to the stationary source's RMP. The final determination may adopt or modify the revisions contained in the preliminary determination under 8.3 of this section or may adopt or modify the substitute revisions provided in the response under 8.4 of this section. A final determination that adopts a revision rejected by the owner or operator shall include an explanation of the basis for the revision. A final determination that fails to adopt a

substitute revision provided under 8.4 of this section shall include an explanation of the basis for finding such substitute revision unreasonable.

8.6 Determination of Violations. Thirty days after completion of the actions detailed in the implementation schedule set in the final determination under 8.5 of this section, the owner or operator shall be in violation of Section 5 Subpart G, 7 **Del.C**., Section 7714(b)(1) and this section unless the owner or operator revises the RMP prepared under Section 6.0 or Subpart G as required by the final determination, and submits the revised RMP as required under Section 5.150.

8.7 Public Access to Determinations. The public shall have access to the preliminary determinations, responses, and final determinations under this section in a manner consistent with Section 14.1 of this Regulation.

8.8 Nothing in this section shall preclude, limit, or interfere in any way with the authority of Department to exercise its enforcement, investigation, and information gathering authorities concerning this regulation. Nothing in this section shall preclude, limit or interfere in any way with the authority granted to EPA under the Clean Air Act of 1990 and codified at 40 U.S.C. 7401 *et seq***.**

9.0 Violations and Penalties

Any person who fails to comply with this regulation shall be subject to the enforcement and penalty provisions set forth in 7 **Del.C.**, Section 7714. A substantially complete risk management program is in compliance with all applicable parts of either Section 5.0 or Section 6.0. Failure to meet these provisions is considered to be substantial non-compliance.

10.0 Hearings

Any public hearing held by the Secretary pursuant to this regulation shall be held in accordance with 7 **Del.C.**, Section 6006, as well as any additional notice and hearing requirements adopted by the Department by regulation.

11.0 Appeals

11.1 Any person(s) whose interest is substantially affected by any action of the Secretary may appeal to the Environmental Appeals Board in accordance with 7 **Del.C**., Section 6008.

11.2 Any person(s), jointly or severally, or any taxpayer, or any officer, department board or bureau of the State, aggrieved by any decision of the Environmental Appeals Board, may appeal to the Superior Court in accordance with 7 **Del.C**., Section 6009.

12.0 State Agency Notification

Every State agency having authority to grant construction or operating permits to covered processes having regulated substances on-site shall notify the Department in writing prior to granting any permits and shall confirm that the owner or operator has been informed of the Regulatory requirements of this regulation.

13.0 Annual Fees

As provided for in 7 **Del.C**., Section 7713.

14.0 Miscellaneous

14.1 Confidential Information. All documents (such as, but not limited to: inspection reports, responses to inspection reports, notices of violation, Administrative Orders and Penalties, correspondences, RMPs and Delaware risk management plans) submitted to the Department or developed by the Department pursuant to this regulation shall be handled consistent with the Freedom of Information Act (29 **Del.C**., Chapter 100) with the exception of the following which shall be maintained as confidential by the Department as required by 7 **Del.C**., Section 7710(b):

14.1.1 Sections of Inspection Notes containing or relating to trade secrets, and/or commercial or financial information observed, viewed or obtained orally during an inspection that may result in substantial harm to a business' competitive edge.

14.1.2 Sections of Inspection Notes containing the identity of persons interviewed during an inspection.

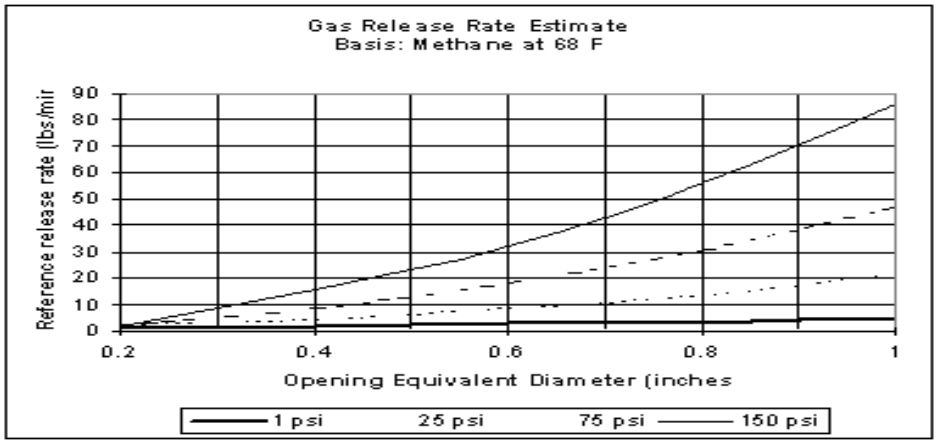
14.2 Severability. If any part of this regulation, or the application of any part thereof, is held invalid or unconstitutional, the application of such part to other persons or circumstances and the remainder of this regulation shall not be affected and shall be deemed valid and effective.

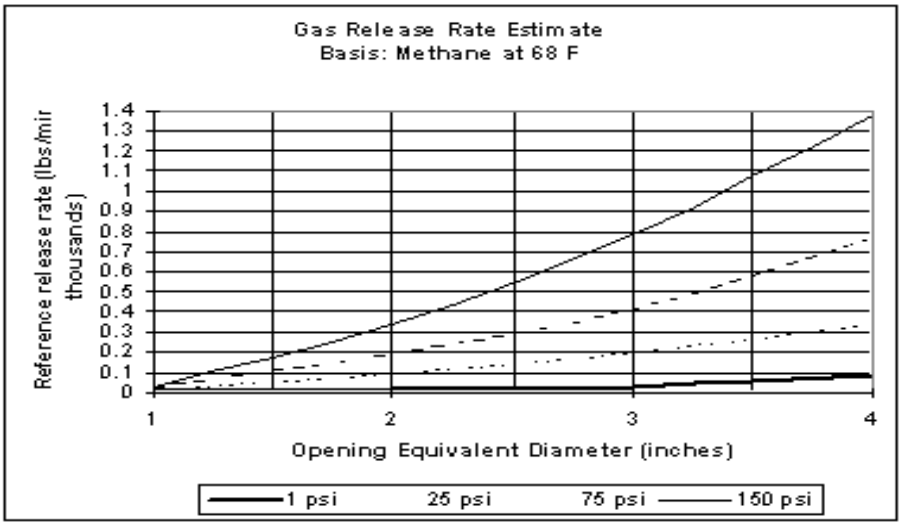
14.3 Transfer of Registration. Registration under this regulation may be transferred to a new owner provided that an intention to transfer accompanied by a copy of the registration, signed by both the transferor and the transferee, is provided to the Department at least 10 days prior to the transfer. A complete RMP or the Delaware risk management plan must be submitted in accordance with either Section 5.190.2.3 or Section 6.6.10.2.3 whichever is applicable.

14.4 Scope of Regulations. This regulation shall apply to all covered processes located in whole or in part within the State of Delaware containing one or more regulated substances.

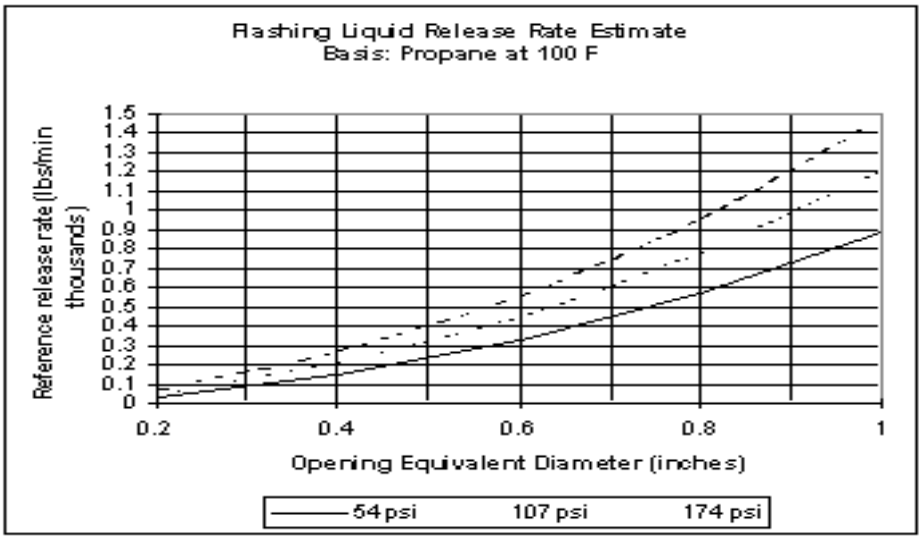
Appendix A

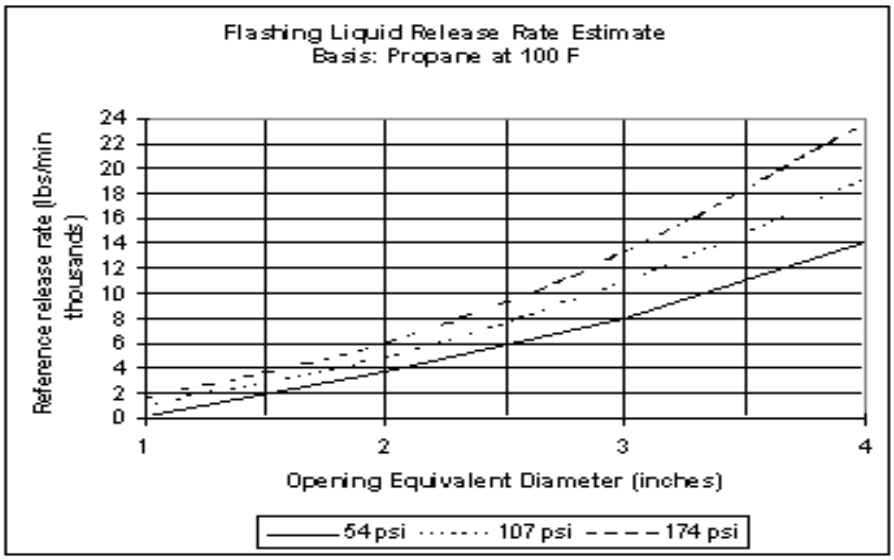
Graphs 1 and 2: Gas Release Estimates for small and large openings



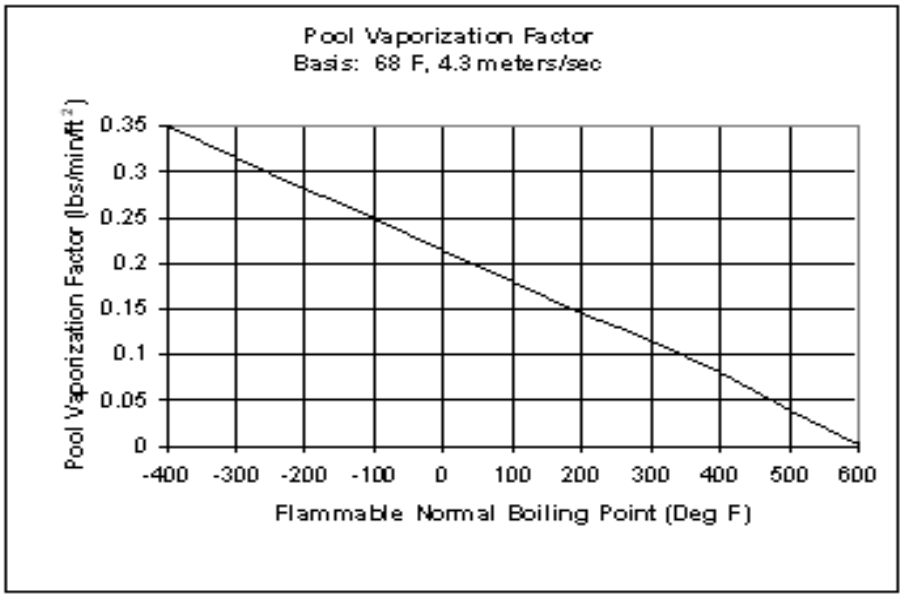


Graphs 3 and 4: Flashing Liquid Release Estimates for small and large openings

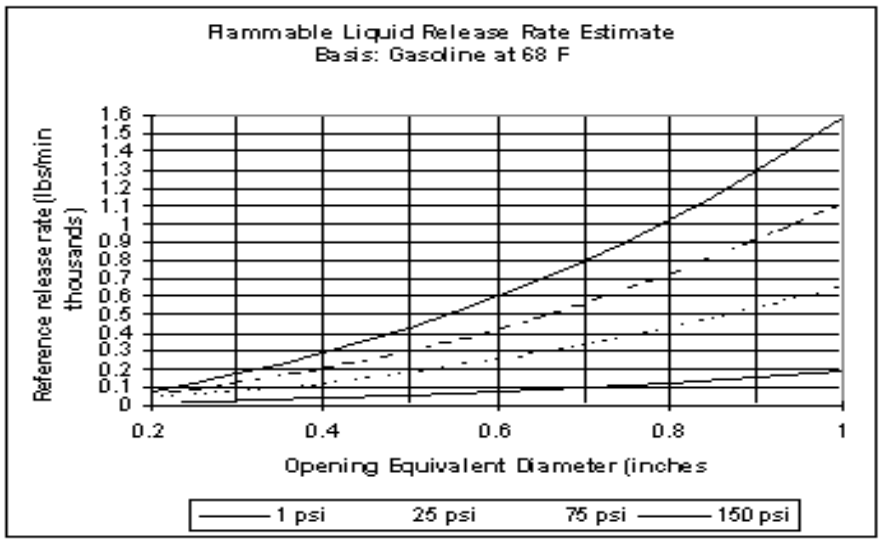


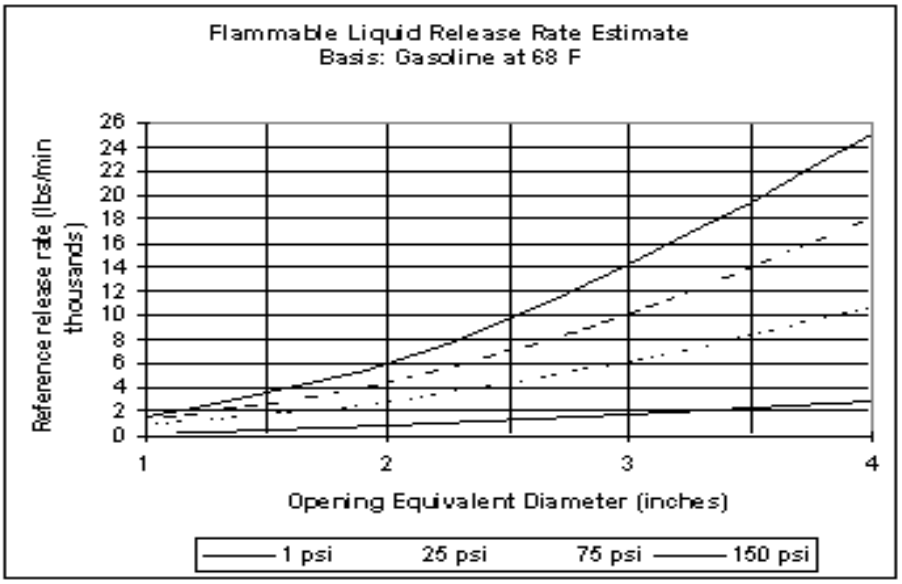


Graph 5: Pool Vaporization Factor



Graphs 6 and 7: Flammable Liquid Release Estimates for small and large openings




Flammable Liquid Release Rate Estimate
Basis: Gasoline at 68 F
Reference release rate (lbs/min thousands)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
Opening Equivalent Diameter (inches)
1 psi
25 psi
75 psi
150 psi