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Hazardous Air Pollutant Emissions from Process Units in the Elastomer Manufacturing Industry--

Basis and Purpose Document for Proposed Standards

NESHAP

EPA-453/R-95-006a

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Emission Standards Division

U.S. Environmental Protection Agency
Office of Air And Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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ENVIRONMENTAL PROTECTION AGENCY

Hazardous Air Pollutant Emissions from Process Units in the Elastomers Manufacturing Industry -- Basis and Purpose Document for Proposed Standards

1. The standards regulate organic hazardous air pollutant (HAP) emissions from the production of butyl rubber, epichlorohydrin elastomers, ethylene-propylene elastomers, Hypalon™, neoprene, nitrile butadiene rubber, polybutadiene rubber, polysulfide rubber, and styrene-butadiene rubber and latex. Only those elastomer product process units that are part of major sources under section 112(d) of the Clean Air Act (Act) will be regulated.

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1.0 PURPOSE OF DOCUMENT

This draft Basis and Purpose Document provides background information on, and rationale for, decisions by the Environmental Protection Agency (EPA) related to the proposed standards for the reduction of hazardous air pollutants (HAP) emitted through the production of nine source categories of elastomers, or synthetic rubbers (Polymers and Resins I). These source categories include Butyl Rubber, Epichlorohydrin Elastomers, Ethylene Propylene Rubber, Hypalon™, Neoprene, Nitrile Butadiene Rubber, Polybutadiene Rubber, Polysulfide Rubber, and Styrene Butadiene Rubber and Latex. This document is intended to supplement the preamble for the proposed standards.

This document is separated into 8 chapters providing a combination of background information and EPA rationale for decisions made in the standards development process. Chapters 2, 3, 5, and 7 provide background information; chapter 2 is an introduction, chapter 3 describes the affected industry, chapter 5 presents the baseline HAP emissions, and chapter 7 presents the predicted impacts associated with the regulatory alternatives. Chapters 4, 6, and 8 provide EPA rationale for subcategorization, determination of MACT "floors" and development of regulatory alternatives, and rationale for the selection of the proposed standards, respectively.

Supporting information and more detailed descriptions for each technical and rationale chapter are contained in the memoranda referenced in this document and contained in the project docket. Chapter 3 is based on a document characterizing the industry; chapters 5 and 7 are based on memoranda describing baseline emissions and impacts of regulatory alternatives, respectively. Development of subcategories is discussed in a separate memorandum, and provides the background for Chapter 4. Material in Chapters 6 and 8 are based on a memorandum that describes determination of MACT floors and development of regulatory alternatives.

Supporting information and more detailed descriptions of certain analyses are contained in the memoranda referenced in this document, the Supplementary Information Document (SID), the preamble, and the project docket.

2.0 INTRODUCTION

Section 112 of the Clean Air Act, as amended in 1990 (1990 Amendments) gives the EPA the authority to establish national standards to reduce air emissions from sources that emit one or more hazardous air pollutants (HAP). Section 112(b) contains a list of HAP to be regulated by National Emission Standards for Hazardous Air Pollutants (NESHAP), and Section 112(c) directs the EPA to use this pollutant list to develop and publish a list of source categories for which NESHAP will be developed. The EPA must list all known source categories and subcategories of "major sources" that emit one or more of the listed HAP. A major source is defined in section 112(a) as any stationary source or group of stationary sources located within a contiguous area and under common control that emits, or has the potential to emit, in the aggregate, considering controls, 10 tons per year or more of any one HAP or 25 tons per year or more of any combination of HAP. This list of source categories was published in the Federal Register on July 16, 1992 (57 FR 31576), and includes the following nine source categories:

- Butyl rubber
- Epichlorohydrin elastomers
- Ethylene propylene rubber
- Hypalon™
- Neoprene
- Nitrile butadiene rubber
- Polybutadiene rubber
- Polysulfide rubber
- Styrene butadiene rubber and latex

The products manufactured by facilities in these nine source categories are called synthetic rubbers, or elastomers.[a] An elastomer is a synthetic polymeric material that can stretch to twice its original length and then return rapidly to approximately its original length when released.[1] Elastomers have long, flexible, chainlike molecules that are able to undergo rapid rotation (flex) as a result of thermal agitation. During processing, intermolecular bonds form an insoluble, three-dimensional network.[2] Elastomer production includes the production of latexes, because a latex is a water emulsion of a synthetic elastomer. The elastomers produced by the nine source categories listed above are used in products such as tires, hoses, belts, footwear, adhesives, caulks, wire insulation, seals, floor tiles, and latexes.

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[a] While the term "elastomer" is used throughout this document and other background material for the proposed NESHAP to describe the products produced by the nine source categories listed above, these products only make up a subset of the wide range of polymers generally referred to as elastomers.

3.0 DESCRIPTION OF THE AFFECTED INDUSTRY

The nine source categories are combined into a single rulemaking, because of similarities in process operations, emission characteristics, and control device applicability and costs. These nine polymer and resin source categories are collectively referred to as the Group I polymers and resins.

The EPA identified a total of 35 plant sites producing one or more of the Group I polymers and resins. All of the facilities considered in the analysis supporting the proposed rule are believed to either be a major source or to be located at a plant site that is a major source.

Table 3-1 shows the identified producers of the nine elastomers, along with facility locations and total category production. The elastomers with the greatest production rates are styrene butadiene rubber and latex, polybutadiene rubber, and ethylene propylene rubber. The majority of the elastomer manufacturing facilities covered in the scope of this NESHAP are located in Texas, Louisiana, Ohio, and Kentucky.

3.1 DESCRIPTION OF PROCESSES AND SOURCES OF HAP EMISSIONS

Polymerization processes are used to manufacture elastomers and synthetic rubbers. A simplified process flow diagram of the elastomer polymerization process is provided in Figure 3-1. Subsequent paragraphs describe the polymerization process in general, and describe emission points from production.

3.1.1 General Process Description

In polymerization, a large number (hundreds to thousands) of relatively simple molecular units, or monomers, are chemically combined to form a macromolecule, or polymer. Polymer manufacturing can be divided into four areas: (1) raw material storage and refining, (2) polymer formation in a reactor (3) stripping and material recovery, and (4) finishing. The

TABLE 3-1. ELASTOMER PRODUCTION FACILITIES

Source Category (1993 Annual Production)[a]	Company	Location
Butyl Rubber Production (230,000 Mg/year)	Non-Halogenated Exxon Corporation Halogenated Exxon Corporation	 Baytown, Texas Baton Rouge, Louisiana
Epichlorohydrin Elastomers Production (8,400 Mg/year)	Zeon Chemicals, Inc.	Hattiesburg, Michigan
Ethylene Propylene Elastomers Production (378,000 Mg/yr)	DSM Copolymer DuPont Company Exxon Corporation Uniroyal Chemical	Addis, Louisiana Beaumont, Texas Baton Rouge, Louisiana Geismar, Louisiana
Hypalon™ Production	DuPont Company	Beaumont, Texas
Neoprene Production - (163,000 Mg/yr)	DuPont Company DuPont Company Miles, Incorporated	Laplace, Louisiana Lousville, Kentucky Houston, Texas
Nitrile Butadiene Rubber Production (124,800 Mg/yr)	Rubber DSM Copolymer Rubber Goodyear Tire & Rubber Uniroyal Chemical Zeon Chemicals Latex Hampshire Chemical Reichhold Chemicals Reichhold Chemicals	 Baton Rouge, Louisiana Houston, Texas Painesville, Ohio Louisville, Kentucky Owensboro, Kentucky Cheswold, Delaware Kensington, Georgia
Polybutadiene Rubber Production (585,000 Mg/yr)	American Synthetic Bridgestone/Firestone Bridgestone/Firestone Goodyear Tire & Rubber Miles, Incorporated	Louisville, Kentucky Orange, Texas Lake Charles, Louisiana Beaumont, Texas Orange, Texas
Polysulfide Rubber Production	Morton International	Moss Point, Mississippi

TABLE 3-1. ELASTOMER PRODUCTION FACILITIES

Source Category (1993 Annual Production)[a]	Company	Location
Styrene-Butadiene Rubber	<u>Latex</u>	
and Latex Production	BASF (Polymer Drive)	Chattanooga, Tennessee
(1,697,000 Mg/yr)	BASF (Amnicola Hwy)	Chattanooga, Tennessee
	Dow Chemical	Dalton, Georgia
	Dow Chemical	Allyn's Point,
	Dow Chemical	Connecticut
	Dow Chemical	Midland, Michigan
	Dow Chemical	Pittsburg, California
	Gencorp	Freeport, Texas
	Goodyear Tire and	Mogadore, Ohio
	Rubber	Calhoun, Georgia
	Goodyear Tire and	Houston, Texas
	Rubber	Owensboro, Kentucky
	Hampshire Chemical	Cheswold, Delaware
	Reichhold Chemicals	Kensington, Georgia
	Reichhold Chemicals	Charlotte, North
	Rhom & Haas	Carolina
	Rhom & Haas	La Mirada, California
	Rhone Poulenc	Gastonia, North
		Carolina
	<u>Rubber</u>	
	American Synthetic	Louisville, Kentucky
	Rubber	Port Neches, Texas
	Ameripol Synpol	Orange, Texas
	Bridgestone/Firestone	Lake Charles, Louisiana
	Bridgestone/Firestone	Baton Rouge, Louisiana
	DSM Copolymer	Odessa, Texas
	General Tire	Beaumont, Texas
	Goodyear Tire & Rubber	Houston, Texas
	Goodyear Tire & Rubber	

[a] Worldwide Rubber Statistics - 1993. International Institute of Synthetic Rubber Producers.

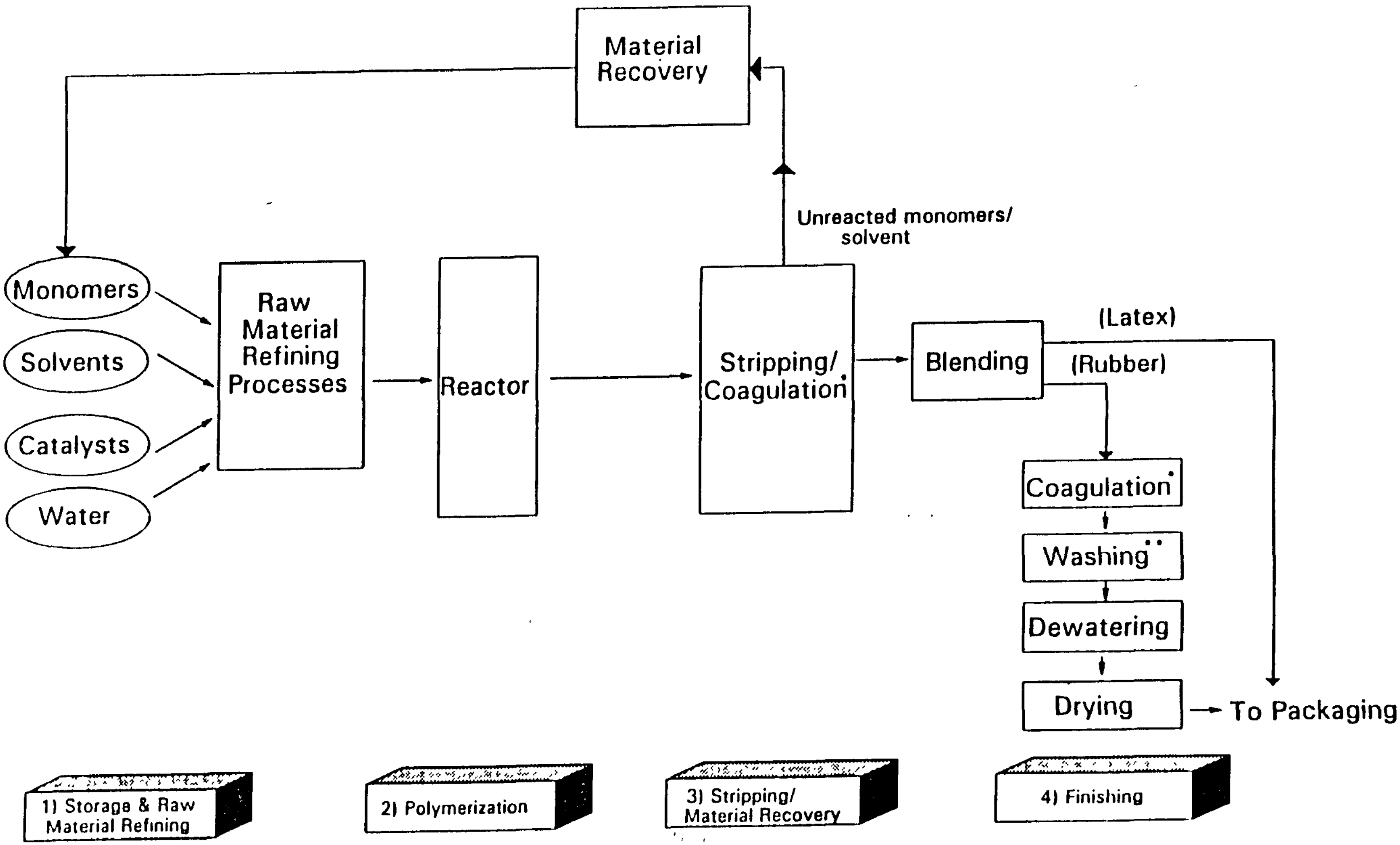

Figure 3-1. Simplified Flow Diagram for Elastomer Manufacturing Processes

* Coagulation occurs during stripping in solvent & bulk processes, but during the finishing steps for emulsion processes

** Washing is not usually necessary in solution processes basic raw materials for polymerization are monomers and either solvents or water. In raw material refining, reaction inhibitors and impurities (e.g., residual undesired chemicals) are removed from the monomer and solvents, often through steam distillation. Subsequent to refining, the monomers are combined with either solvents or water, and are charged to a reactor.

Two types of polymerization are generally used in the elastomers manufacturing industry: solution and emulsion. In solution polymerization, monomers are dissolved in an organic solvent, while in emulsion polymerization, monomers are dispersed in water using a soap solution, or an "emulsifier." Because the conversion of monomers to polymer chains is never complete, unreacted monomer remains in the product following polymerization. Therefore, the reactor contents are sent to a stripping operation, which commonly uses steam, following polymerization to recover product, unreacted monomers, and, if a solution process was used, solvent. Finally, finishing operations consist of blending, aging, coagulation (to produce solid polymers), washing, and drying processes, depending on the eventual use of the polymer.

3.1.2 Description of Emission Points

Four types of hazardous air pollutant (HAP) emission sources are commonly found at elastomer production facilities: storage of pure HAP used as raw materials, process-related emissions (process vents and process fugitives), waste and wastewater collection and treatment operations, and equipment leaks (pumps, valves, connectors, etc). Emissions from atmospheric storage vessels typically occur as working and breathing losses. Residual concentrations of VOC are usually very low in intermediate and finished elastomer products.

Process-related HAP emission points include vents from monomer refining, polymerization, monomer stripping, material recovery, finishing, and drying operations. In addition, significant fugitive emissions can occur during the finishing and drying of solid polymer products. Emissions from the reactors in the polymerization area may occur during initial charging of the reactants and/or during pressure relief in the polymerization reaction. These emissions may be steady or sporadic, depending on the mode of process operation (i.e., continuous or batch), and generally contain HAP monomer(s) and/or solvent. The HAP concentration in reactor vent emissions can be relatively high, due to the high concentrations of unreacted monomer and solvent present in the reactor.

Vent streams from stripping unit operations can have high HAP concentrations, but they are usually routed to a material recovery device that recovers the valuable monomer or solvent for re-use. Therefore, vents to the atmosphere from these operations are typically located at the exit of a recovery device.

Finishing emissions can be associated with coagulation tanks, slurry or blending tanks, and dewatering screens and filters. HAP concentrations in finishing area vent streams are much less than the concentrations in reactor or stripper vent streams. Dryer vents are often the largest source of process vent emissions from elastomer production. These vents are characterized by low concentrations of HAP, but very large volumetric flow rates. The elevated temperatures encountered in the dryers may increase the volatility of residual monomers and solvents that were not removed in the previous processing steps, and may cause them to be emitted during drying operations.

The emissions from many of the finishing and drying operations are not completely captured or vented to traditional vent stacks. Finishing operations are often located in large warehouse-type building, and process fugitive emissions are removed from the work space through roof fans and other general building ventilation.

The differences between the HAP emission characteristics related to the reaction/stripping/material recovery operations and to those related to the finishing and drying operations have led the EPA to consider and analyze these parts of the processes separately. The term "process front-end" was coined to include all operations prior to the stripping and material recovery operations, and the term "process back-end" was created to represent the finishing and drying operations.

Equipment leaks occur primarily at connections between different equipment components.[3] The characteristics of these emissions for the polymers and resins industry are similar to those associated with the Synthetic Organic Chemical Manufacturing Industry (SOCMI), and are discussed in greater detail in the Hazardous Organic NESHAP (HON). Emissions from equipment leaks associated with operations downstream from coagulation equipment will be minimal, due to low residual VOC and HAP content in the streams.

Wastewater streams containing organic compounds may be generated during elastomer production. Sources of wastewater containing HAP include the monomer refining, stripping, material recovery, and finishing processes. While the largest wastewater generation is associated with the finishing process, the concentration of HAP in finishing wastewater is usually very low, because residual HAP have been removed during the stripping of the raw product. No wastewater is produced during the drying operations.

3.1.3 Summary of Processes

Table 3-2 shows the types of processes that were identified to be in use at active facilities in each source category. Although other types of processes that produce these products were described in the literature, no plants were identified that actively used these other processes.

A detailed description of each manufacturing process, and of HAP emission points for each of the elastomer source categories covered by the proposed NESHAP, is contained in the memorandum "Industry Characterization and Production -- Elastomer Production Facilities (Polymers and Resins I)," and in the SID.[4,5]

TABLE 3-2. ELASTOMERS PRODUCTION PROCESSES BY SUBCATEGORY

Source Category	Rubber by Emulsion	Rubber by Solution	Latex (Emulsion)	Other
Butyl Rubber Production		✓		
Epichlorohydrin Elastomers Production		✓		
Ethylene-Propylene Elastomers Production		✓		✓
Hypalon™ Production		✓		
Neoprene Production	✓		✓	
Nitrile Butadiene Rubber Production	✓		✓	
Polybutadiene Rubber Production		✓		
Polysulfide Rubber Production		✓		
Styrene-butadiene Rubber and Latex Production	✓	✓	✓	

4.0 SUBCATEGORIZATION OF THE LISTED SOURCE CATEGORIES

Within three of the nine listed elastomer production source categories, significant variations in manufacturing process and/or HAP emissions exist. Therefore, the EPA has split these three categories -- butyl rubber, nitrile-butadiene rubber, and styrene-butadiene rubber -- into subcategories, for the purposes of regulation in this NESHAP. In addition, because of significant similarities in process and HAP emissions, the EPA has combined the polybutadiene rubber source category with one of the subcategories of styrene butadiene rubber. The technical basis of these subcategorization decisions is briefly described below. A more detailed discussion of the technical basis for subcategorization may be found in the memorandum entitled "Subcategorization of the Elastomers and Synthetic Rubbers Industry (Polymers and Resins I)," and in the SID.[5,6]

The butyl rubber source category was divided into subcategories for production of butyl rubber and production of halobutyl rubber, because of variations in both the production processes and the HAP emitted. While the initial portion of the production processes are similar, the halobutyl rubber process contains two additional unique production steps. In these additional steps additional HAP are used and are also, therefore, emitted.

The nitrile butadiene subcategory was divided into subcategories for production of rubber and production of latex, because the production process and HAP emissions differ significantly. The initial polymerization and stripping steps are similar, except that the latex polymerization is typically a higher conversion reaction, resulting in considerably less HAP monomer (1,3-butadiene and acrylonitrile) remaining in the intermediate latex prior to stripping. However, the largest difference between these two processes is that in the production of nitrile butadiene rubber, the polymer is coagulated and dried, while in the production of latex, the stripped latex is simply blended with other specialty ingredients to produce the final nitrile butadiene latex product. The drying and finishing steps for nitrile butadiene rubber are significant sources of HAP emissions. Latex production does not contain these production steps, and does not produce significant HAP emissions after the stripping operations.

The styrene butadiene rubber and latex source category was divided into three subcategories, because of significant technical process and HAP emission differences: (1) the production of rubber by solution, (2) the production of rubber by emulsion, and (3) the production of latex. First, the solution process is differentiated from the emulsion processes (which includes latex), because the solution polymerization reaction is carried out in organic solvents, while the emulsion polymerization reactions are carried out in water with emulsifiers. This difference results in completely dissimilar process details and emissions.

The rationale for subcategorization discussed above for nitrile butadiene rubber (NBR) and latex (NBL) also applies to styrene butadiene rubber and latex. As in the case of NBR and NBL, the major reasons for differentiation are the extent to which monomers are converted in the polymerization reaction, and the fact that the rubber is coagulated and dried, while the latex is not.

In addition to the creation of styrene butadiene rubber by solution as a subcategory of styrene rubber production, the EPA found that all plants that produce styrene butadiene rubber using a solution process also produce polybutadiene rubber using a solution process, often using the same process equipment. Only one facility produced polybutadiene rubber using a solution process and did not also produce styrene butadiene rubber.

Therefore, a single subcategory was created that included facilities that produce both polybutadiene and styrene butadiene rubber using solution processes.

The EPA concluded that subcategorization was not necessary in three of the production processes (epichlorohydrin rubber, Hypalon®, and polysulfide rubber) named in the Source Category List, because only one facility was identified that currently manufactures each product. Subcategorization was also not required for neoprene rubber, because all active facilities currently use similar production processes with comparable HAP emission characteristics. Therefore, for the purposes of this regulatory effort, one category was appropriate.

The EPA considered two other possible subcategorizations. First, the single facility that produces polybutadiene rubber using a solution process, but does not also produce styrene butadiene rubber, uses an organic solvent that is not a HAP. Second, one ethylene propylene rubber producer uses a suspension process that differs from the solution process used by the other four ethylene propylene rubber producers. While there are technical process and HAP emission differences in both of these situations, the EPA concluded that the creation of separate subcategories was not necessary, because the MACT floors, regulatory alternatives, and impacts for practically all emission source types would not be affected by subcategorization. However, it should be noted that these two unique facilities were not included in the determination of the MACT floors for the back-end of the processes.

In summary, the nine Group I polymer and resins source categories were separated and analyzed as 12 separate subcategories.[a] These subcategories are:

- Butyl rubber (BR)
- Epichlorohydrin elastomers (EPI)
- Ethylene propylene rubber (EPR)
- Halobutyl rubber (HBR)
- Hypalon™ (HYP)
- Neoprene (NEO)
- Nitrile butadiene latex (NBL)
- Nitrile butadiene rubber (NBR)
- Polybutadiene rubber and styrene butadiene rubber by solution (PBR/SBRS)
- Polysulfide rubber
- Styrene butadiene latex (SBL)
- Styrene butadiene rubber by emulsion (SBRE)

Figure 4-1 contains a schematic of subcategorization for the Group 1 polymers and resin NESHAP.

[a] For the purposes of this document, the term "subcategory" will be generally used to describe the group of sources that were analyzed together. Actually, these groups consist of source categories as defined in the EPA's original list, subcategories of source categories, and, in one instance, the combination of a subcategories and a source category.

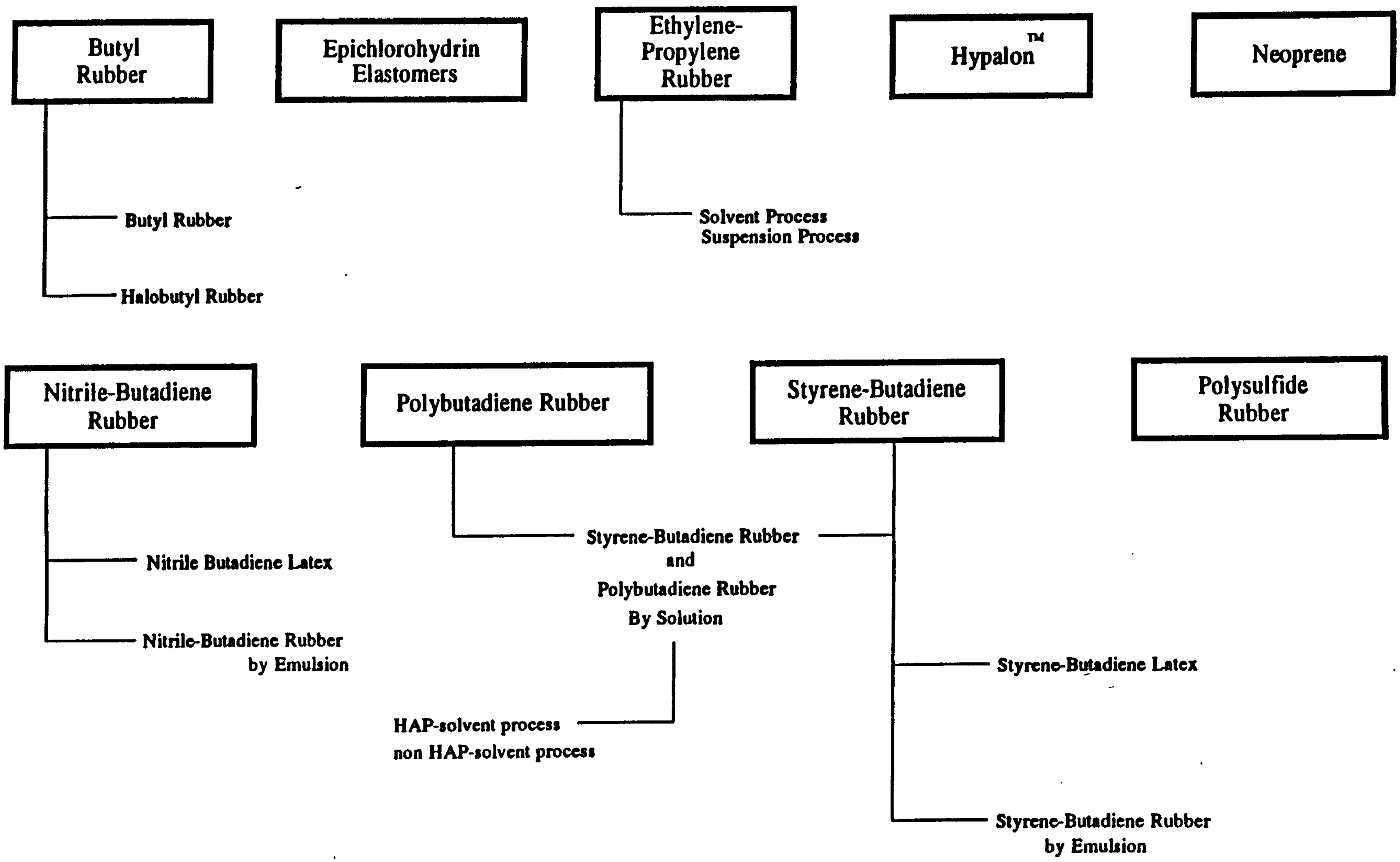

Figure 4-1. Polymers and Resins I Subcategorization Plan

5.0 BASELINE EMISSIONS

Baseline HAP emissions for the Group I polymers and resins subcategories are presented in Table 5-1. As shown in the table, the total nationwide estimated HAP emissions are over 13,000 megagrams per year.

The HAP emitted include n-hexane, styrene, 1,3-butadiene, acrylonitrile, methyl chloride, hydrogen chloride, carbon tetrachloride, chloroprene, and toluene. Quantity of emissions for each individual HAP was not determined, but n-hexane and styrene are estimated to comprise the largest quantity of emissions. The HAP are shown by subcategory in Table 5-2.

As described in Section 3.1.2, HAP are emitted from storage, process vents and process fugitives, wastewater, and equipment leaks. The process vents and fugitives are the source type that comprises the largest portion of these emissions. In particular, large quantities of HAP are emitted from process emissions points defined as "back-end," meaning finishing and drying; these points make up 45 percent (over 6,000 Mg/yr) of total HAP emissions. Further, the back-end process emissions from three subcategories, ethylene propylene rubber (EPR), polybutadiene and styrene butadiene rubber by solution (PBR/SBRS), and styrene butadiene rubber by emulsion (SBRE), make up almost 90 percent of the process back-end emissions, and almost 40 percent of the total annual HAP emissions for all Group I polymers and resins.

Emission estimates were made for each facility in active operation. Emissions for storage and process vents were taken directly from information submitted by each facility. Emissions from wastewater were calculated by using wastewater stream flow rates and HAP concentrations reported by the facilities and the fraction emitted (F_e) values found in the HON.[7] In some cases, flow and concentration values were extrapolated from those at

TABLE 5-1. BASELINE HAP EMISSIONS

Subcategory	Baseline HAP Emissions (Mg/yr)					
	Storage	Front-End Process Vents	Back-End Process Operations	Wastewater Operations	Equipment Leaks	Total
Butyl rubber	0	367	110	149	322	948
Epichlorohydrin elastomer	10	1	16	7	127	161
Ethylene propylene rubber	19	220	1,995	20	1,088	3,342
Halobutyl rubber	65	684	281	0	269	1,299
Hypalon™	7	50	29	0	12	98
Neoprene	44	352	204	21	120	741
Nitrile butadiene latex	2	4	0	104	49	159
Nitrile butadiene rubber	1	38	115	8	425	587
Polybutadiene rubber/styrene butadiene rubber by solution	4	169	2,403	26	843	3,445
Polysulfide rubber	1	0	0	0	0	1
Styrene butadiene latex	9	289	0	691	444	1,433
Styrene butadiene rubber by emulsion	8	20	852	84	83	1,047
TOTAL (percent of total)	170 (1)	2,194 (16)	6,005 (45)	1,110 (8)	3,782 (29)	13,261

TABLE 5-2. MAJOR HAZARDOUS AIR POLLUTANTS EMITTED BY SUBCATEGORY

Subcategory	Major HAP's Emitted
Butyl Rubber	methyl chloride, hexane
Epichlorohydrin Elastomers	epichlorohydrin, toluene
Ethylene-Propylene Rubber	methyl chloride, hexane
Halogenated Butyl Rubber	methyl chloride, hexane
Hypalon™	carbon tetrachloride, chloroform
Neoprene	hydrogen chloride, chloroprene toluene
Nitrile Butadiene Latex	acrylonitrile, butadiene
Nitrile-Butadiene Rubber	acrylonitrile, butadiene
Polybutadiene/Styrene Butadiene Rubber By Solution	hexane, butadiene, styrene, toluene
Polysulfide Rubber	ethylene oxide, ethylene dichloride, formaldehyde
Styrene Butadiene Latex	styrene, butadiene
Styrene Butadiene Rubber by Emulsion	styrene, butadiene

other facilities in the same subcategory. Similarly, the baseline emissions from equipment leaks were calculated by using component counts provided by facilities (or they were extrapolated from the component counts provided by other facilities in the same subcategory), and emission factors from EPA's Equipment Leak Protocol document.[8] The level of equipment leak control assumed for each facility was based either on information submitted or on applicable State regulations. More detailed information on the calculation of baseline emissions for the proposed NESHAP is contained in the memorandum "Baseline Emissions for Elastomer Production Facilities (Polymers and Resins I)," and in the SID.[5,9]

6.0 MACT FLOORS AND REGULATORY ALTERNATIVES

This chapter presents the approach used to develop Maximum Achievable Control Technology (MACT) floors and regulatory alternatives for the Polymers and Resins I subcategories. First, the Clean Air Act requirements for the determination of MACT floors and regulation alternatives are discussed. The rationale for the selection of the approach used to determine the MACT floors is provided. Then, a description of the application of this approach is provided, followed by the results of the analyses. The final section of this chapter discusses the rationale for deciding upon alternatives that are more stringent than the MACT floors.

6.1 CLEAN AIR ACT REQUIREMENTS

The amended Clean Air Act contains requirements for the development of regulatory alternatives for sources of HAP emissions. Section 112(d) requires emission standards for HAP to reflect the maximum degree of reduction in emissions of HAP that is achievable. This control level is referred to as MACT.

The Clean Air Act also provides guidance on determining the least stringent level allowed for a MACT standard; this level is termed the "floor." For new sources, emission standards "shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source." For existing sources, the emissions standards must be at least as stringent as either "the average emission limitation achieved by the best performing 12 percent of the existing sources," or, for categories or subcategories with less than 30 sources, "the average emission limitation achieved by the best performing 5 sources."

All of the Group I subcategories have less than 30 sources, meaning that the MACT floor must be based on the best performing

5 sources. Only one subcategory, styrene butadiene latex (SBL), contains more than 5 sources. Therefore, for all subcategories except SBL, the MACT floor is based on the "average emission limitation" of all sources in the subcategory. The best performing 5 SBL facilities were determined separately for each emission source type (storage, process, etc). In a June 6, 1994 Federal Register notice, the EPA presented its interpretation of the statutory language concerning the MACT floor for existing sources.

While the MACT floor represents the least stringent level of control for a standard, the EPA can consider regulatory alternatives more stringent than the floor. The Clean Air Act specifies, however, that the EPA should consider cost, non-air quality health and environmental impacts, and energy impacts, in evaluating regulatory alternatives more stringent than the MACT floor.

6.2 SELECTION OF MACT FLOOR APPROACHES

The EPA first considered a direct approach to determine the MACT floors. However, problems arose with this approach, because process operation and associated emission points varied considerably, even within a subcategory. A comparison of control techniques was inappropriate, because the origin and characteristics of streams of the same emission source type were so different.

Therefore, the EPA studied methods to simplify the MACT floor analysis, and decided to use the Hazardous Organic NESHAP, or HON (40 CFR 63 subparts F, G, and H), in the MACT floor analysis. The rationale for this decision is provided in the following section.

6.2.1 HON-Based Approach

There are many similarities between the equipment, emissions, and control techniques associated with the elastomers industry and the synthetic organic chemical manufacturing industry (SOCMI), which is regulated by the HON. The HAP monomers and solvents used in the elastomers industry are all

SOCMI chemicals, and many elastomers processes are co-located with SOCMI processes.

The HON contains emission limitations for five emission source types, most of which are also of concern in the elastomers regulatory effort. These emission source types are process vents, storage vessels, transfer operations, wastewater, and equipment leaks. For each emission source type, applicability is based on the "generic" characteristics of the emission point, such as HAP emissions, HAP concentration, flow rate, size of the equipment, etc. Thus, these applicability determinations could easily be applied to elastomers sources.

A HON-based approach was practical, because the HON provides "ready-made" alternatives. That is, the HON analysis takes into account equipment type, equipment size, equipment contents, stream characteristics, and other important aspects of the emission source that should be considered in the floor determination.

Because of the similarities between the SOCMI and elastomers industries, and due to the inappropriateness of a direct approach, as discussed above, the EPA concluded that the HON requirements for storage vessels, process vents, wastewater, and equipment leaks were appropriate to use as a regulatory alternative for the elastomer industry. The determination of the MACT floor using the HON requirements is described in Section 6.3.

The HON requirements noted above apply to three of the five elastomers emission source types and to part of a fourth: storage vessels, wastewater, and equipment leaks, as well as front-end process vents from continuous processes. However, the HON process vent provisions exempt vents from batch processes, and some of the front-end operations in the elastomers industry are operated in a batch mode. In addition, the process back-end operations in the elastomers industry are unlike any operations in the HON. Therefore, different approaches were needed to determine the alternatives for these two emission source types;

the approach to batch front-end process vents and process back-end operations are discussed in the following two sections.

6.2.2 Batch Front-End Process Vents

The EPA would have preferred a direct approach for determining MACT floors for batch front-end process vents. However, as with the MACT floor for other emission source types, the variability in processes, the fact that vents were seldom identified as batch vents, and the fact that many batch vents were combined with continuous vents, made any direct approach unworkable. Therefore, the EPA considered other approaches.

In 1993, the EPA published a guidance document, "Control of Volatile Organic Compound Emissions From Batch Processes" (EPA-453/R-93-017). This alternative control technique (ACT) document provides guidance to State and local air pollution regulatory agencies on the development of regulations for air emissions from batch processes.

The guidance in the document is intended to apply to all batch operations. While the polymer and resin process described in the document (epichlorohydrin-based nonnylon polyamide) was not an elastomers process, the equipment, emission sources and control technologies for the industry studied are similar to those in the elastomers industry.

A great deal of the analysis in the ACT was dedicated to the generation of process vent applicability criteria for three levels of control: 90-, 95-, and 98-percent control. As with the HON, the applicability criteria are based on general vent stream characteristics, and not on process-specific parameters. These general vent stream characteristics include the volatility of the organic material in the vent stream, the annual emissions, and the average flow rate of the stream.

Due to the similarities between the processes studied in the ACT and the elastomer batch front-end processes, and the general nature of the applicability criteria, the EPA concluded that these criteria were appropriate to use in defining the alternatives for batch front-end process vents in the elastomers industry. The determination of the alternatives using the Batch ACT is described in Section 6.3.

6.2.3 Back-End Process Emissions

Many of the elastomers subcategories produce dry elastomers products. As described in Section 3.1, the processes to finish the rubber include many unit operations that do not have process vents comparable to SOCMI process vents. Therefore, for the process back-end, the MACT floors were determined on a subcategory-specific basis, as described in the following section.

6.3 PROCEDURES USED TO DETERMINE MACT FLOORS

Two basic procedures were used to determine the MACT floors for the Group I subcategories. The first, the HON-based approach, compared existing levels of control to the level of control that would be required at elastomers facilities if the HON requirements were applied. This approach was used for storage vessels, wastewater, and equipment leaks. For front-end process vents, the same approach was used, except that the 90-percent control level from the Batch ACT was used for batch processes, and the HON process vent provisions were used for continuous processes. The 90-percent Batch ACT control level was selected because the estimated cost-effectiveness for this level was comparable to the cost-effectiveness of the HON continuous vent provisions.

A second approach was used to assess the average emission limitation for back-end process emissions, which was based on emission reduction techniques used for each specific subcategory. Both of these approaches are discussed in more detail below.

6.3.1 HON-Based Approach - Existing Sources

As noted above, the intent of this approach is to determine how controls at existing elastomers facilities compare to the level of control that would be required by the HON (and the Batch ACT). This type of analysis does not provide specific numeric values for a floor. Rather, the conclusion of each floor analysis using this HON-based approach is whether the MACT floor is less stringent than, more stringent than, or equal to, the HON-level of control.

For each facility in each subcategory, the existing controls were identified for each emission point. The existing level of control was then compared to the level of control that would be required by the HON/Batch ACT, and the emission point was characterized as being controlled at a level less stringent than the HON/Batch ACT requirements (less than HON), a level equivalent to the HON/Batch ACT requirements (equal to HON), or a level more stringent than the HON/Batch ACT requirements (greater than HON).

After each emission point at each facility was characterized, all emission points of a given emission source type were grouped together and a facility-wide determination was made for each emission source type. For instance, if a storage vessel was controlled at a level less stringent than the HON, and no other storage vessel was controlled at a level more stringent than the HON, the facility was classified as "less than HON" for storage vessels. If all controls at the facility were equivalent to the HON levels, the facility was classified as "equal to HON." If one or more points was controlled at a level more stringent than the HON, and no point of the same type was controlled at a level less stringent than the HON, the facility was classified as "greater than HON."

It is important to note, however, that if an emission point was uncontrolled, and the HON/Batch ACT would not require control for that point, the level of control is equivalent to the HON/Batch ACT level of control. Therefore, the floor for a subcategory could be the HON/Batch ACT, when in fact all emission points of that particular emission source type were uncontrolled.

If a facility reported different levels of control (in comparison to the HON) within one emission source type, an additional analysis was necessary to classify the facility. In these situations, the existing emission level was compared to the emission level that would be required if HON controls were applied. If the existing emissions were less than the HON-level emissions, the facility was classified "greater than HON," but if the HON-level emissions were lower, the facility was classified "less than HON."

Information was seldom provided that identified whether a front-end process vent was continuous or batch. For this reason, the HON criteria were applied to all vents, unless it was clearly indicated that the vent originated from a batch process, in which cases the Batch ACT was used. In a few situations, it appeared that the vent was a batch vent, but it was not explicitly stated. In these situations both the HON and Batch ACT were applied. In each case where this occurred, the HON and Batch ACT gave consistent results on whether control would be required.

The floor for each emission source type was defined for each subcategory as less than, equal to, or greater than, the HON level of control. This determination was based on the majority of individual facility classifications for that emission source type. For instance, if a subcategory contained 5 sources, and 3 of those sources had storage vessel controls less stringent than the HON, one equal to the HON, and one more stringent than the HON, the floor was determined as less stringent than the HON.

6.3.2 HON-Based Approach - New Sources

The HON-based approach used for new sources was similar to the existing source approach. The existing level of control for each emission point was compared with the level that would be required by the HON new source requirements. The Batch ACT requirements for new and existing sources are the same.

After each emission point at each facility was characterized as less than, greater than, or equal to, the new source HON, all emission points of a given emission source type were grouped together and a facility-wide determination was made for each emission source type. This determination was conducted as described in section 5.3.1.

The new source floor was then defined for each emission source type for each subcategory as less than, equal to, or greater than, the new source HON level of control. This determination was based on the single facility with the highest level of control in the subcategory. If a single facility was classified as equivalent to the new source HON, and no facilities were classified as greater than the new source HON, the new source floor was identified as the new source HON level of control. However, if one facility was classified as greater than the new source HON, the determination of a new source floor based on that facility was necessary.

6.3.3 Approach For Process Back-End Emissions - Existing Sources

6.3.3.1 Residual HAP emissions. As noted above, emissions from the back-end of elastomer production processes are not amenable to HON-type applicability and control provisions. In only one instance did a facility report that add-on control was used to reduce back-end HAP emissions [a facility producing polybutadiene rubber and styrene butadiene rubber by solution (PBR/SBRS)]. However, facilities in three subcategories [ethylene propylene rubber (EPR), PBR/SBRS, and styrene-butadiene rubber by emulsion (SBRE)] reported permit conditions requiring that the amount of residual HAP remaining in the polymer be reduced by "improved stripping" prior to drying (i.e., "residual HAP limits").

MACT floors were determined on a subcategory-specific basis for the back-end emissions from these three subcategories. The format for each floor is in terms of stripper performance, or the amount of HAP remaining in the polymer after the stripping step. In the cases of EPR and PBR/SBRS, the floor is expressed as the weight of residual HAP per weight of dry polymer. In the case of SBRE, the floor is expressed as the weight of residual HAP per weight of latex leaving the stripper. These formats were selected to be compatible with the formats of applicale State permit conditions for the three subcategories.

A number of statistical parameters can be used to establish the numerical level of the MACT floor, including the arithmetic mean, median, or mode. In this case, the selection of any specific parameter is complicated by the need to maintain confidentiality, and by the small number of plants in each subcategory. This is because the format of the floor is in terms of HAP per polymer produced, and production data were often claimed as confidential. If the floor for a given subcategory was based on a rigorously computed arithmetic mean, some companies could use the floor to calculate production figures for their competitors. To avoid this problem, the floor for each subcategory was established at a level between the mean, median, and mode.

In each case, the floor is expressed as a maximum weekly average residual HAP level. For SBRE, the weekly floor was computed from maximum weekly average HAP in latex data submitted by the plants. For EPR and PBR/SBRS, the weekly floors are based largely on annual emissions and production data submitted by the plants. A limited amount of weekly data was used to adjust the annual data to allow for some temporal variability in residual HAP levels.

The weekly time frame was selected for two reasons. First, the waiting period to obtain residual monomer results for a given sample will be up to three days for some categories. The weekly timeframe allows a plant to compensate for a "bad" batch and still achieve the standard. Second, some grades of polymer are more difficult to strip than others. Because the MACT floor is based on an overall average, some of the less strippable grades may have residual HAP levels that exceed the average floor level. A shorter timeframe might preclude plants from producing these grades at all. The weekly timeframe gives plants the opportunity to continue producing these grades, as long as average emissions are below the standard.

6.3.3.2 Carbon disulfide emissions. The discovery of carbon disulfide emissions from dryer vents at SBRE facilities occurred relatively late in the information gathering process for this standard. Therefore, the amount of information available to determine the floor for this emission source was limited. Data were provided that indicated measured carbon disulfide concentrations in dryer stacks. The MACT floor was calculated as the average of the concentrations for those grades of SBRE polymer that used a sulfur-containing shortstopping agent in their production.

6.3.4 Approach For Process Back-End Emissions - New Sources

The new source MACT floors for back-end process emissions should represent the level achieved by the best-performing single facility. However, a major problem exists in the use of this approach, because the emission factor or residual HAP level for a single facility is almost always confidential, so the actual level of the standard could not be revealed.

Therefore, the following approach was used to set the new source MACT floor. The ratio of the existing source MACT floor emission factor/residual HAP level to the best performing single facility emission factor/residual HAP was determined for each subcategory. The arithmetic average of all subcategory ratios was then applied to the existing source floor levels to determine new source floors.

6.4 RESULTS OF MACT FLOOR DETERMINATION

Table 6-1 shows the results of the MACT floor analyses. For nine of the twelve subcategories, the MACT floor for one or more emission source type (excluding back-end process emissions) was determined to be less stringent than the HON. Wastewater was the emission source type where the MACT floor was most often equal to the HON, but in almost all subcategories that was because no control was reported, and no control would have been required by the HON. The MACT floors for equipment leaks were determined to be less than the HON, except for three subcategories that are already subject to the HON equipment leak provisions through subpart I for all components in HAP service. The following discussion provides details of the determinations for each subcategory.

6.4.1 Butyl Rubber

Butyl rubber is a single plant subcategory. Therefore, the existing level of control at this facility represents the MACT floor for the subcategory.

The three HAPs stored at the butyl rubber facility are hexane, methyl chloride, and methanol. All of the storage

TABLE 6-1. SUMMARY OF MACT FLOOR DETERMINATIONS FOR ELASTOMER SUBCATEGORIES

Subcategory	MACT Floors				
	Storage	Front-End Process Vents	Back-End Process Emissions	Wastewater	Equipment Leaks
Butyl	= HON	< HON/ACT	no control	< HON	< HON
Epichlorohydrin	= HON	< HON/ACT	no control	= HON	< HON
Ethylene Propylene	< HON	< HON/ACT	MACT floor residual HAP limit	= HON	< HON
Halobutyl	< HON	< HON/ACT	no control	= HON	< HON
Hypalon®	= HON	= HON/ACT	no control	= HON	= HON
Neoprene	< HON	< HON/ACT	no control	= HON	< HON
Nitrile Butadiene Latex	< HON	= HON/ACT	no control	= HON	< HON
Nitrile Butadiene Rubber	< HON	= HON/ACT	no control	= HON	< HON
Polybutadiene/Styrene Butadiene Rubber by Solution	= HON	= HON/ACT	MACT floor residual HAP limit	= HON	< HON
Polysulfide	= HON	= HON/ACT	no control	= HON	< HON
Styrene Butadiene Latex	= HON	= HON/ACT	no control	= HON	= HON
Styrene Butadiene Rubber by Emulsion	= HON	= HON/ACT	MACT floor residual HAP limit	= HON	= HON

vessels are controlled in accordance with the HON. Therefore, the floor for storage vessels was determined to be equal to the HON.

All front-end process vent streams are controlled by a flare. However, the streams would be classified as halogenated vent streams under the HON. The HON does not allow the control of a halogenated vent stream using a flare, but would require the stream be controlled by an incinerator followed by a scrubber. Therefore, the existing level of control for these vents is less stringent than the HON. In addition, there is an uncontrolled maintenance vent that appears to be a batch process vent. Application of the Batch ACT criteria showed that this vent would require control. The floor for front-end process vents was determined to be less stringent than the HON/ACT.

Since no add-on control or permit conditions were reported for the process back-end, the floor for process back-end emissions was defined as no control.

There were uncontrolled wastewater streams reported by the facility that would be subject to the HON control requirements. Therefore, the floor for wastewater was determined to be less stringent than the HON.

The facility reported that equipment leak emissions were controlled by the combination of a leak detection and repair program and some "leakless" equipment. However, elements of the program were less stringent than the HON level, so the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the butyl rubber subcategory are as follows. For storage vessels, the floor was determined to be equal to the HON. For front-end process vents, wastewater, and equipment leaks, the floor was determined to be less stringent than the HON (HON/ACT). For back-end process emissions, the floor was determined to be no control.

6.4.2 Epichlorohydrin Elastomer

Epichlorohydrin elastomer is a single plant subcategory. Therefore, the existing level of control at this facility represents the MACT floor for the subcategory.

The HAP reported to be stored at the epichlorohydrin facility are epichlorohydrin, propylene oxide, ethylene oxide, and toluene. All of the storage vessels are controlled in accordance with the HON, so the floor for storage vessels was determined to be equal to the HON.

All reported front-end process vent streams are controlled by a flare. However, sufficient information was not provided to estimate the stream characteristics prior to the flare. It was assumed that this control, and therefore the floor, was equal to the HON/ACT.

Since no add-on control or permit conditions were reported for the process back-end, the floor for process back-end emissions was defined as no control.

There were no wastewater streams reported by the facility that would be subject to the HON control requirements, and no wastewater control was reported. Therefore, the floor for wastewater was determined to be equal to the HON.

The facility reported that equivalent leak emissions were controlled by a leak detection and repair program. However, elements of the program were less stringent than the HON level, so the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the epichlorohydrin elastomer subcategory are as follows. For storage vessels and wastewater, the floor was determined to be equal to the HON. For equipment leaks, the floor was determined to be less stringent than the HON. The floor for front-end process vents was assumed to be equal to the HON/ACT. For back-end process emissions, the floor was determined to be no control.

6.4.3 Ethylene Propylene Rubber

Five active facilities were identified that produce ethylene propylene rubber. As discussed in Chapter 4.0, four of the EPDM facilities employ a solution process that uses a HAP solvent (hexane), and the fifth uses a suspension process. The suspension process facility was included in the determination of MACT floors using the HON based approach. However, the differences in the processes made it inappropriate to consider it in the calculation of the process back-end floor.

The HAP stored at EPDM facilities include hexane and toluene. Four of the five EPDM facilities reported existing storage tank controls that were less stringent than the level of control that would be required by the HON. The controls less stringent than the HON included hexane tanks controlled by condensers with control efficiencies less than the HON, and toluene and hexane storage tanks with fixed roof uncontrolled tanks. One facility did not report sufficient information to determine a classification for storage tank controls. Since four of the five facilities are controlled at a level less stringent than the HON, the floor for storage vessels was determined to be less stringent than the HON.

No EPDM facility reported a batch process, so the HON process vent provisions were applied to all front-end process vents. At one facility, the estimated TRE of a controlled stream was greater than 1.0, so controls at this facility were more stringent than the HON. One facility reported that a halogenated vent stream was controlled by a boiler, and an uncontrolled vent stream with a TRE less than 1.0. Another facility also had an uncontrolled vent stream with a TRE less than 1.0. Controls at these two facilities were less stringent than the HON. One facility reported controls in accordance with the HON. The final facility did not report sufficient information for front-end process vents. With two facilities equal to the HON, one less than, and one greater than, the floor for front-end process vents was determined to be less stringent than the HON/ACT.

One EPDM facility reported a residual HAP permit condition, establishing that the reduction of back-end HAP emissions was demonstrated for this subcategory. The average, mode, and median annual emission factors were determined and adjusted to weekly, as described in the approach section. For existing sources, the floor was determined to be 10 kg HAP per megagram dry crumb rubber, on a weekly average basis. The new source floor was determined to be 5 kg/Mg. As noted above, the suspension process EPDM facility was not included in the back-end floor analysis.

There were no wastewater streams at EPDM facilities with reported (or extrapolated) characteristics that would require control by the HON, and no wastewater controls were reported. Therefore, the floor was determined to be equal to the HON for wastewater.

Four facilities reported that equipment leak emissions were controlled by a leak detection and repair program, and one facility also reported some leakless equipment. However, elements of the programs at three of these facilities were less stringent than the HON level. The program at the fourth facility appeared to be very similar the HON. One facility did not report any program. Since four of five facilities were less than the HON, the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the ethylene propylene rubber subcategory are as follows. For storage vessels, front-end process vents, and equipment leaks, the floor was determined to be less stringent than the HON (HON/ACT). For wastewater, the floor was determined to be equal to the HON. For back-end process emissions, the floor was determined to be a residual HAP limit of 9 kilograms (5 kilograms for new sources) HAP per megagram dry crumb rubber processed in the stripping operations in a week.

6.4.4 Halobutyl Rubber

Halobutyl rubber is a single plant subcategory. Therefore, the existing level of control at this facility represents the MACT floor for the subcategory.

At the halobutyl rubber facility, hexane was stored in fixed roof uncontrolled tanks, and control would be required by the HON. Therefore, the floor for storage vessels was determined to be less stringent than the HON.

At the butyl rubber facility, three halogenated streams are controlled by a flare. The HON does not allow the control of a halogenated vent stream using a flare, but would require the stream be controlled by an incinerator followed by a scrubber. A fourth vent stream entering the flare has a TRE greater than 1.0, which is control more stringent than the HON. A comparison was made between the existing HAP emissions level and the emissions level that would result from application of only HON controls. The result is that the HAP emissions at the existing level of control were over three times greater than the emissions that would result after application of the HON. This difference was primarily due to the reduction in the HCl emissions from the flare. Therefore, the floor for front-end process vents was determined to be less stringent than the HON/ACT.

Since no add-on control or permit conditions were reported for the process back-end, the floor for process back-end emissions was defined as no control.

There were no wastewater streams reported by the facility that would be subject to the HON control requirements, and no wastewater control was reported. Therefore, the floor for wastewater was determined to be equal to the HON.

The facility reported that equipment leak emissions were controlled by a leak detection and repair program. However, elements of the program were less stringent than the HON, so the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the halobutyl rubber subcategory are as follows. For wastewater, the floor was determined to be equal to the HON. For storage, front-end process vents, and equipment leaks, the floor was determined to be less stringent than the HON (HON/ACT). For back-end process emissions, the floor was determined to be no control.

6.4.5 Hypalon®

Hypalon® is a single plant subcategory. Therefore, the existing level of control at this facility represents the MACT floor for the subcategory.

At the Hypalon® facility, all storage vessels are controlled in accordance with the HON, and the floor for storage vessels was determined to be equal to the HON.

This facility reported two uncontrolled front-end process vents. Both vents had TREs greater than 1.0, and would not require control by the HON. Therefore, the floor for front-end process vents was determined to be equal to the HON.

Since no add-on control or permit conditions were reported for the process back-end, the floor for process back-end emissions was defined as no control.

No wastewater streams that would require control by the HON, and no wastewater control was reported. Therefore, the floor for wastewater was determined to be equal to the HON.

As noted earlier, Hypalon® is one of the subcategories subject to the HON equipment leak provisions. It is expected that all components in HAP service at this facility are subject to the HON requirements. Therefore, the floor was determined to be equal to the HON for equipment leaks.

In summary, all MACT floors for the Hypalon® subcategory were determined to be equal to the HON (HON/ACT), except for back-end process emissions. For back-end process emissions, the floor was determined to be no control.

6.4.6 Neoprene

Three active facilities were identified that produce neoprene. These three facilities were used in the determination of MACT floors.

The primary HAP used in this subcategory is chloroprene, and all three facilities reported that chloroprene storage vessels were controlled at a level less stringent than the HON. Therefore, the floor for storage vessels was determined to be less stringent than the HON.

Two of the facilities reported information for uncontrolled front-end process vents that indicate control would be required by the HON. Therefore, the floor for front-end process vents was determined to be less stringent than the HON.

Since no add-on control or permit conditions were reported for the process back-end at any neoprene facility, the floor for process back-end emissions was defined as no control.

There were no reported wastewater streams at neoprene facilities with characteristics that would require control by the HON, and no wastewater control was reported. The floor for wastewater was determined to be equal to the HON.

All three neoprene facilities reported that equipment leak emissions were controlled by a leak detection and repair program. However, elements of all three programs were less stringent than the HON, so the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the neoprene subcategory are as follows. For wastewater, the floor was determined to be equal to the HON. For storage, front-end process vents, and equipment leaks, the floor was determined to be less stringent than the HON (HON/ACT). For back-end process emissions, the floor was determined to be no control.

6.4.7 Nitrile Butadiene Latex

Three facilities were identified that produce nitrile-butadiene latex. Each of these facilities also produce styrene-butadiene latex, and equipment is sometimes shared between these two products. A separate analysis was conducted for NBL, although it is possible that the primary product at one or more of these facilities may be SBL, and not NBL.

The HAP reported to be stored at NBL facilities include acrylonitrile, styrene, ethyl acrylate, 1,3-butadiene, acrylic acid, vinylidiene dichloride, and formaldehyde (formalin). Each facility reported that acrylonitrile was stored in fixed roof uncontrolled tanks, which would require control under the HON. Similarly, acrylic acid was stored in fixed roof uncontrolled tanks at two facilities. The butadiene and vinylidiene chloride were stored in pressure tanks. Since all three facilities were controlling storage vessels at a level less than the HON, the MACT floor was determined to be less stringent than the HON.

It is believed that at least some of the front-end operations at NBL facilities are batch. However, information submitted by the facilities did not identify which of the front-end process vents were from batch processes. Therefore, the HON and Batch ACT 90 percent applicability criteria were applied to all vents for comparison with existing controls. Each facility controls one or more front-end process vents using a combustion device. It was determined that both the HON and Batch ACT would require control for all these vents. Further, all uncontrolled vents at these facilities would not be subject to control under either the HON or Batch ACT. Therefore, the level of control for NBL front-end process vents was determined to be equal to the HON/ACT.

As indicated in the name of the subcategory (nitrile butadiene latex), the final product is a latex and not a dried solid. Operations after the stripper at NBL facilities have little HAP emission potential due to the low residual acrylonitrile concentrations. The floor for NBL back-end process emissions was determined to be no control.

No wastewater controls were reported at any NBL facility. At two facilities, all reported streams were below the HON applicability criteria. At the third facility, there was one uncontrolled wastewater stream for which the HON would require control. Since two of three facilities were at the HON level, the floor for wastewater was determined to be equal to the HON.

Since these facilities also produce SBL, each is subject to the HON equipment leak provisions for components in styrene and butadiene service used to produce SBL. It is anticipated that many of the components in butadiene service are shared with the NBL process. Therefore, an equipment leak program equivalent to the HON is required at each NBL facility. However, it was assumed that each facility was controlled at a level less stringent than the HON because components in acrylonitrile service are not subject to the HON provisions. Therefore, the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the nitrile butadiene latex subcategory are as follows. For front-end process vents and wastewater, the floor was determined to be equal to the HON (HON/ACT). For storage and equipment leaks, the floor was determined to be less stringent than the HON. For back-end process emissions, the floor was determined to be no control.

6.4.8 Nitrile-Butadiene Rubber

Four active facilities were identified that produce nitrile butadiene rubber. At one facility, the NBR equipment is also used to produce SBR by the emulsion process, as well as SBL. Information submitted by this facility related to NBL production was included in the floor analyses for this subcategory.

Industry requested that separate subcategories be created for batch NBR and continuous NBR processes, since two facilities use continuous processes and two use batch processes[10,11] The EPA recognizes differences in emissions and control technologies for batch and continuous processes. However, separate subcategories were not created because the EPA believes that the use of both the HON and Batch ACT process vent provisions is satisfactory to address differences in batch and continuous process vents. Furthermore, the EPA believes the HON storage, wastewater, and equipment leak provisions are applicable to batch processes, and that batch processes may be compared with continuous processes using the HON-based approach described earlier.

Two facilities reported storage vessel controls less stringent than the HON. At one, acrylonitrile was stored in fixed roof uncontrolled tanks, and the other facility vented an acrylonitrile storage vessel to a scrubber with an efficiency less than the 95 percent required by the HON. At one facility, all HAP storage tanks are vented to a flare. The fourth facility did not submit sufficient information to allow a classification for storage vessels. Therefore, since two of three facilities submitting sufficient information were controlled at a level less than the HON, the floor was determined to be less stringent than the HON for storage vessels.

The two continuous process facilities control front-end process vents with combustion devices meeting the HON requirements. It was estimated that these vents would require control under the HON process vent provisions, making these two facilities equal to the HON. At the two batch facilities, all front-end process vents were uncontrolled, but all vents would not require control based on the Batch ACT criteria. Therefore, it was determined that the floor for NBR front-end process vents was equal to the HON/Batch ACT.

Since no add-on control or permit conditions were reported for the process back-end at any NBR facility, the floor for process back-end emissions was defined as no control.

Based on the available information, it was estimated that there are no wastewater streams at NBR facilities with characteristics that would require control by the HON. Further, no wastewater control was reported at any NBR facility. Therefore, the floor for NBR wastewater was determined to be equal to the HON.

Two facilities reported that emissions from equipment leaks were controlled by leak detection and repair programs. However, elements of the programs were less stringent than the HON, so these two facilities were determined to be less stringent than the HON. For the facility that also produces SBRE, a HON program is in place for components in styrene and butadiene service used to produce SBRE. It is anticipated that many of the components in butadiene service are shared with the NBR process at this facility. However, it was assumed that this facility was also controlled at a level less stringent than the HON because components in acrylonitrile service are not subject to the HON provisions. The final facility did not report any program to reduce emissions from leaking equipment. Therefore, the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the nitrile butadiene rubber subcategory are as follows. For front-end process vents and wastewater, the floor was determined to be equal to the HON (HON/ACT). For storage and equipment leaks, the floor was determined to be less stringent than the HON. For back-end process emissions, the floor was determined to be no control.

6.4.9 Polybutadiene Rubber and Styrene-Butadiene Rubber by Solution

There were four active facilities identified that produce both PBR and SBR using the solution process, and another facility that produces PBR using the solution process. As discussed in the Chapter 4, the four facilities producing both SBR and PBR use a HAP (hexane or toluene) solvent. The facility producing only PBR reported the use of a non-HAP solvent. Representatives of this company have indicated that one of their two PBR processes is in the process of switching to a HAP solvent.[12] The non-HAP process facility was included in the determination of MACT floors using the HON based approach. However, the differences in the processes made it inappropriate to consider it in the calculation of the back-end floor.

Two of the facilities reported storage vessel controls more stringent than the HON. In both instances, this was because styrene tanks, which would not require control under the HON, were controlled with floating roofs. The three remaining facilities controlled hexane, styrene, and butadiene in a manner that was equivalent to HON controls. Therefore, the floor for PBR/SBRS storage vessels was determined to be equal to the HON.

It was assumed that all front-end process vents at these facilities are continuous, so the HON process vent provisions were used to determine the floor. At two facilities, all front-end vents were combined and routed to a flare, and one or more of the vent streams would not have required control under the HON. Therefore, these two facilities were classified as greater than the HON. One facility controlled all vents that would have required control under the HON, and all uncontrolled vents would not have required HON control. The final two facilities did not report any control, and did not report any vent streams that would have required HON control. Since three facilities were determined to be equivalent to the HON, the floor for PBR/SBRS front-end process vents was determined to be equal to the HON.

One PBR/SBRS facility reported a permit condition limiting dryer emissions, and another reported that all dryer vents were vented to a boiler. These instances establish that the reduction of PBR/SBRS back-end HAP emissions was demonstrated for this subcategory. The average, mode, and median annual emission factors were determined and adjusted to weekly, as described in the approach section. For existing sources, the floor was determined to be 5 kg HAP per megagram dry crumb rubber, on a weekly average basis. The new source floor was determined to be 3 kg/Mg. As noted above, the facility using a non-HAP solvent was not included in the back-end floor analysis.

There were no wastewater streams at PBR/SBRS facilities with reported (or extrapolated) characteristics that would require control by the HON, and no facilities reported wastewater controls. Therefore, the floor for wastewater was determined to be equal to the HON.

Producers of PBR and SBR are subject to the HON equipment leak provisions, but only for components in styrene and butadiene service. Therefore, each PBR/SBRS facility is required to have a HON equipment leak program in place. However, it was assumed that each of the four HAP solvent facilities was controlled at a level less stringent than the HON because components in hexane or toluene service are not subject to the HON provisions. Therefore, the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the polybutadiene and styrene butadiene by solution subcategory are as follows. For storage vessels, front-end process vents, and wastewater, the floor was determined to be equal to the HON (HON/ACT). For equipment leaks, the floor was determined to be less stringent than the HON. For back-end process emissions, the floor was determined to be a residual HAP limit of 5 kilograms (3 kilograms for new sources) HAP per megagram dry crumb rubber processed in the stripping operations in a week.

6.4.10 Polysulfide Rubber

Polysulfide rubber is a single plant subcategory. Therefore, the existing level of control at this facility represents the MACT floor for the subcategory.

At the polysulfide rubber facility, ethylene oxide, ethylene dichloride, and formaldehyde (formalin) were stored in accordance with HON requirements. Therefore, the floor was determined to be equal to the HON for storage tanks.

The front-end process vent information submitted by the polysulfide rubber facility indicated that no control was present. No control would be required by the HON, so the floor was determined to be equal to the HON for front-end process vents.

Since no add-on control or permit conditions were reported for the process back-end, the floor for process back-end emissions was defined as no control.

There were no wastewater streams reported by the facility that would be subject to the HON control requirements, and no wastewater control was reported. Therefore, the floor for wastewater was determined to be equal to the HON.

The facility reported no information on the control of emissions from equipment leaks. Therefore, the floor for equipment leaks was determined to be less stringent than the HON.

In summary, the MACT floors for the polysulfide rubber subcategory are as follows. For storage vessels, front-end process vents, and wastewater, the floor was determined to be equal to the HON. For front-end process vents, and equipment leaks, the floor was determined to be less stringent than the HON. For back-end process emissions, the floor was determined to be no control.

6.4.11 Styrene-Butadiene Latex

As noted above, the styrene butadiene latex subcategory was the only subcategory containing more than 5 sources. Seventeen facilities were identified that currently produce SBL. One of these facilities began operations after the original information requests were made, so this facility was not included in the floor analyses. Another facility is a styrene butadiene rubber by emulsion facility that removes a stream of latex (after stripping but prior to coagulation) from the rubber production line and blends and finishes it to make a final latex product. This facility was also not included in the MACT floor analyses.

The first step was to identify the best performing 5 facilities. Since the MACT floor analysis was conducted on a "plank" basis, the best performing 5 facilities were determined separately for each emission source type.

For storage vessels, the HON storage vessel provisions were used to determine the best performing 5 facilities. Each SBL facility was classified as less than, greater than, or equal to the HON storage vessel control level. This analysis showed that there was one facility controlling storage vessels at a level more stringent than the HON, six with controls equal to the HON, and six with controls less stringent than the HON. It was assumed that a facility's relationship to the HON was a direct reflection of the level of control. In other words, those facilities with controls greater than the HON were considered to be the best controlled facilities. Therefore, the best controlled five facilities consist of four with controls equal to the HON, and one with controls greater than the HON. The floor for SBL storage vessels was determined to be equal to the HON.

For front-end process vents, an emission factor approach was used to identify the best performing 5 facilities. The use of an emission factor (HAP emissions per unit of production) would take into account process modifications and other pollution prevention actions which decrease HAP emissions, eliminating the need for add-on control. The five SBL facilities with the lowest emission factors were identified as the best controlled. The HON/Batch ACT approach was then used to determine the "average" control of these five. Of these five, one was determined to control at a level more stringent than the HON/ACT, and the remaining four were classified as equal to the HON/ACT. Therefore, the floor for SBL front-end process vents was determined to be equal to the HON/ACT.

As indicated in the name of the subcategory (styrene butadiene latex), the final product is a latex and not a dried solid. Operations after the stripper at SBL facilities have little HAP emission potential due to the low residual styrene concentrations. The floor for SBL back-end process emissions was determined to be no control.

Similar to storage vessels, a HON-comparison approach was used to identify the five SBL facilities with the best wastewater control. Actually, there was not an SBL facility that reported wastewater control for any stream. There were two facilities with reported (or extrapolated) streams that would require control under the HON, making them less stringent than the HON. Therefore, the remaining 13 facilities, and the MACT floor for SBL wastewater, were determined to be equal to the HON.

The HON was used to identify the best controlled facilities for equipment leaks. Producers of SBL are subject to the HON equipment leak provisions for components in styrene and butadiene service. Several facilities reported the use of other HAP in the production of SBL, but seven reported the use of styrene and butadiene only. Therefore, all components in HAP service at these seven facilities are required to be controlled at the HON level. No facility reported a program more stringent than the HON level. Therefore, the floor for SBL equipment leaks was determined to be equal to the HON.

In summary, all MACT floors for the styrene butadiene latex subcategory were determined to be equal to the HON, except for back-end process emissions. For back-end process emissions, the floor was determined to be no control.

6.4.12 Styrene-Butadiene Rubber by Emulsion

Four active facilities identified that produce styrene butadiene rubber using the emulsion process. These four facilities were used in the determination of MACT floors.

Two of the four SBR-E facilities reported existing storage tank controls equal to the HON. One facility reported that styrene was stored in tanks vented to a carbon adsorber, which is more stringent control than the HON. The fourth facility did not report sufficient information to allow a comparison to the HON level of control. The majority of facilities in this subcategory (for which information was available) controlled emissions equal to the HON. Therefore, the floor for SBRE storage vessels was determined to be equal to the HON.

For front-end process vents, three facilities reported control for all vents with TREs less than 1.0 and all streams with TREs greater than 1.0 were uncontrolled. Therefore, these three facilities were classified as equal to the HON. Sufficient information was not available to reach a conclusion for the fourth facility. Therefore, the floor for SBRE front-end process vents was determined to be equal to the HON.

Three of the four SBRE facilities reported permit conditions limiting the amount of residual styrene in the stripped latex prior to coagulation. This establishes that the reduction of SBRE back-end HAP emissions was demonstrated for this subcategory. Residual styrene in latex information was provided by each of the four facilities. The average, mode, and median maximum weekly residual styrene limits were determined as described in the approach section. For existing sources, the floor was determined to be 0.35 kg HAP per megagram latex, on a weekly average basis. The new source floor was determined to be 0.2 kg/Mg.

One SBRE facility reported a controlled wastewater stream whose extrapolated flow and concentration were below the HON applicability levels, making the wastewater controls at this facility greater than the HON. Two facilities reported no control, and no streams that would require control. The fourth facility reported control for a stream that would not require control under the HON, but also reported flows and concentrations for two uncontrolled streams that would require HON control. For this facility, a comparison was done between the existing emission levels and the levels that would be present if control was applied only to the HON streams. This revealed that total plant-wide emissions would be slightly lower at the HON level of control, resulting in the classification of this facility as less than the HON. With two facilities equal to the HON, one more stringent, and one less stringent, it was determined that the MACT floor for SBRE wastewater was equal to the HON.

As noted previously, producers of SBR are subject to the HON equipment leak provisions for components in styrene and butadiene service. No SBRE facility reported the use of any HAP other than styrene and butadiene, leading to the conclusion that all components in HAP service are subject to HON control. The floor for equipment leaks was determined to be equal to the HON.

In summary, all MACT floors for the styrene butadiene rubber by emulsion subcategory were determined to be equal to the HON, except for back-end process emissions. For back-end process emissions, the floor was determined to be a residual HAP limit of 0.35 kilograms (0.2 kilograms for new sources) HAP per megagram latex processed in the stripping operations in a week.

6.5 REGULATORY ALTERNATIVES BEYOND THE MACT FLOORS

Except in a few limited cases, only one regulatory alternative was developed and analyzed for each subcategory. Table 6-2 presents the regulatory alternatives for existing sources by subcategory. The rationale for the level of this alternative is discussed below.

If the MACT floor for an emission source type was determined to be less stringent than the HON/ACT level of control, the regulatory alternative included the HON/ACT level of control for that emission source. The rationale for this action was that in its extensive evaluation of the HON requirements, the EPA concluded that the cost and other impacts of the HON-level of control were reasonable for storage vessels, continuous process vents, wastewater, and equipment leaks. Similarly, the EPA determined that the cost and other impacts associated with the Batch ACT 90-percent level of control were reasonable. Based on these previous analyses, the EPA determined that it was acceptable to increase the stringency of the single regulatory alternative beyond the MACT floor level.

TABLE 6-2. SUMMARY OF EXISTING SOURCE REGULATORY ALTERNATIVES FOR ELASTOMER SUBCATEGORIES

Subcategory	Existing Source Regulatory Alternatives				
	Storage	Front-End Process Vents	Back-End Process Emissions	Wastewater	Equipment Leaks
Butyl and Halobutyl					
Reg Alt I	HON	HON/ACT, exempting halogenated vent streams controlled by flare before proposal date	no control	HON	HON
Reg Alt II	HON	HON/ACT	no control	HON	HON
Epichlorohydrin, Hypalon®, Neoprene, Nitrile Butadiene Latex, Nitrile Butadiene Rubber, Polysulfide, Styrene Butadiene Latex					
Reg Alt I	HON	HON/ACT	no control	HON	HON
Ethylene Propylene, Polybutadiene/Styrene Butadiene Rubber by Solution, Styrene Butadiene Rubber by Emulsion					
Reg Alt I	HON	HON/ACT	MACT floor residual HAP limit	HON	HON

However, industry-specific factors were considered when the MACT floor was determined to be less stringent than the HON/ACT. If special circumstances were identified for a subcategory that increased the cost (or other impacts) of the HON or Batch ACT controls to a level that the EPA no longer considered reasonable, a regulatory alternative less stringent than the HON level (but at least as stringent as the MACT floor) was identified and analyzed. The only situations in which this occurred were at process vents for the BR and HBR subcategories, which are both single-plant subcategories.

For BR and HBR front-end process vents, the MACT floor was determined to be less stringent than the HON/ACT. Both facilities vent halogenated vent streams to a flare, resulting in hydrogen chloride emissions. The HON would not allow a halogenated vent stream to be controlled by a flare, meaning that these facilities would need to install incinerators to control the halogenated organic compound, followed by scrubbers to control the hydrogen chloride generated by the combustion of the halogenated organic. The only emission reduction that could be attributed to the HON-level regulatory alternative would be the hydrogen chloride emissions, while the full cost of the incinerators and scrubbers would be incurred. This made the HON-level cost-ineffective for these subcategories. An intermediate regulatory alternative was developed that required the HON level of control for all front-end process vents, except for halogenated vent streams that were already vented to a flare. The HON level of control was maintained as a second regulatory alternative for both subcategories (Regulatory Alternative 2).

If the MACT floor was determined to be equal to the HON, the regulatory alternative was set at the MACT floor (i.e., the HON/ACT). If a MACT floor had been determined to be more stringent than the HON/Batch ACT, it would have been necessary for the regulatory alternative to reflect the MACT floor. However, this situation did not occur for any existing emission source type for any subcategory.

During the development of the HON, alternatives more stringent than the promulgated levels were considered and rejected by the EPA. Therefore, it was unnecessary to consider controls more stringent than the HON levels, since the EPA had previously considered them unacceptable.

Similarly, the Batch ACT analyzed and estimated impacts for control levels more stringent than the 90-percent level. As noted above, the 90-percent level was selected because of the relationship of the costs to the environmental benefits. Therefore, it was also unnecessary to consider batch process vent control levels more stringent than the 90-percent Batch ACT level.

Options more stringent than the MACT floor for the process back-end were also not developed. For those subcategories where the MACT floor for the process back-end was determined to be no control, it was concluded that control of back-end emissions was not demonstrated, and there were, therefore, no known back-end options more stringent than the floor. For subcategories where the reduction of process back-end emissions was demonstrated (and a MACT floor was calculated), the EPA concluded that sufficient information was not available to develop options more stringent than the MACT floor. In addition, as shown in Chapter 7, the cost-effectiveness of the MACT floor options for the subcategories with back-end MACT floors was high, and the EPA concluded that options more stringent than the MACT floor would be not be cost-effective.

Following a rationale similar to that used for existing sources, if the new source floor was determined to be less stringent than the new source HON level, the regulatory alternative for new sources was raised to the new source HON level.

7.0 IMPACTS OF REGULATORY ALTERNATIVES

This section discusses the impacts of the existing source regulatory alternatives described in Chapter 6.0. The impacts discussed include primary environmental impacts, secondary environmental impacts, energy impacts, and costs.

No impacts are presented for the new source regulatory alternatives because no new growth is expected in the near future. This assumption is based on three factors: (1) The current demand is well below capacity for most types of synthetic rubber, (2) synthetic rubber production has become a global market, and there is also a great deal of unutilized capacity in other areas of the world, and (3) new elastomers products (that would not be included in one of these nine source categories) have emerged that compete directly with existing synthetic rubber products. The assumption of no projected growth is described in more detail in a memorandum entitled "Estimated Regulatory Alternative Impacts for Elastomer Production Facilities (Polymers and Resins I)," and in the SID.[5,13]

7.1 PRIMARY ENVIRONMENTAL IMPACTS

Primary environmental impacts are the emissions reductions of HAP that occur as a result of application of the regulatory alternative presented in Table 6-2. The HAP emission reductions were calculated by theoretically applying sufficient controls to each emission source to bring them into compliance with the regulatory alternative. For process vents, storage tanks, and wastewater, the controls were always applied to previously uncontrolled sources, while for equipment leaks the required control was incremental.

As shown in Table 7-1, the regulatory alternative is expected to reduce HAP emissions by almost 6,400 Mg/yr. This

TABLE 7-1. HAP EMISSION REDUCTION BY SUBCATEGORY

Subcategory	HAP Emission Reduction (Mg/yr)						Percentage Reduction from Baseline
	Storage	Front-End Process Vents	Back-End Process Operations	Wastewater Operations	Equipment Leaks	Total	
Butyl rubber	0	211	0	102	293	606	64%
Epichlorohydrin elastomer	4	0	0	0	120	124	77%
Ethylene propylene rubber	2	85	979	0	1,020	2,087	62%
Halobutyl rubber	62	38	0	0	233	335	26%
Hypalon™	0	0	0	0	0	0	0%
Neoprene	0	258	0	0	96	354	48%
Nitrile butadiene latex	0	0	0	94	41	135	85%
Nitrile butadiene rubber	1	0	0	0	364	365	62%
Polybutadiene rubber/ styrene butadiene rubber by solution	0	0	882	0	637	1,519	44%
Polysulfide rubber	0	0	0	0	0	0	0%
Styrene butadiene latex	0	22	0	272	332	627	44%
Styrene butadiene rubber by emulsion	0	0	195	48	0	243	23%
TOTAL (percent of total reduction)	69 (1)	615 (10)	2,056 (32)	516 (8)	3,136 (49)	6,392	48%

represents a 49 percent reduction over the baseline emission level. Baseline HAP emissions from the epichlorohydrin (EPI) and nitrile-butadiene latex (NBL) subcategories are expected to be reduced by 80 and 85 percent, respectively. These represent the largest subcategory reductions (on a percentage basis) that are anticipated. Facilities producing Hypalon® and polysulfide rubber are not estimated to require any additional control to meet the regulatory alternative level.

Around 47 percent of the total HAP emission reduction will be achieved through the equipment leak provisions. The combination of required controls on equipment leaks and process vents accounts for 90 percent (around 6,000 Mg/yr) of the total expected HAP emission reduction.

7.2 SECONDARY ENVIRONMENTAL IMPACTS

While the primary impact of the regulatory alternative is to reduce HAP emissions, the application of control technologies can also have other positive environmental effects, such as a reduction in non-HAP volatile organic compound air emissions; however, the environmental effects can also be negative, such as through the generation of additional wastewater or solid waste. In this section the secondary impacts on air pollution, water pollution, and solid and hazardous wastes are discussed.

7.2.1 Air Pollution

For the sources included in this project, the secondary air pollution impacts are the increased criteria pollutant emissions caused by the on-site combustion of organic HAP and fuels. This combustion results in the emission of nitrogenous oxides (NO_x), carbon monoxide (CO), particulate matter (PM), and sulfur dioxide (SO_2).

There is no on-site combustion associated with the selected control technologies for either storage tanks or equipment leaks. Therefore, no secondary air impacts are expected from these technologies. The total criteria air pollutant emissions resulting from process vent and wastewater control are estimated to be around 282 Mg/yr, with NO_x emissions from incinerators and boilers accounting for around 258 Mg/yr. The emissions associated with wastewater controls constitute only around 4.5 Mg/yr of this total.

The emission of these five criteria pollutants will also occur as a result of the combustion of coal, oil, or natural gas, which are used to generate the additional energy needed for control equipment. These off-site air impacts were not included in this analysis, although energy impacts are considered in Section 7.3.

7.2.2 Water Pollution Impacts

Potential water pollution impacts from several of the control technologies are associated with the regulatory alternative. The wastewater and equipment leak controls actually have positive effects on water quality, although these effects are minimal. There also may be minimal negative effects associated with the storage vessel requirements.

The largest potential impact on water pollution is associated with the use of an incinerator/scrubber system for control of halogenated organic HAP vent streams. In a scrubber control system, water is used to remove the acid gas contained in the thermal oxidizer outlet stream. The amount of wastewater generated is equal to the amount of water needed by the scrubber to absorb the acid gas leaving the incinerator. It is estimated that almost 46 million gallons of wastewater will be generated annually from acid scrubbers at butyl rubber (BR), ethylene-propylene rubber (EPR), and neoprene (NEO) facilities. Almost 41 million of this total are from the BR facility, which is only attributed to Regulatory Alternative 2 (which was not selected - see Chapter 8).

7.2.3 Solid and Hazardous Waste Impacts

There are no significant solid or hazardous waste impacts associated with the implementation of the regulatory alternatives presented in Table 6-2.

7.3 ENERGY IMPACTS

The energy demands associated with the control technologies for the regulatory alternative include the need for additional electricity, natural gas, and fuel oil. The storage tank and equipment leak controls are not expected to require any additional energy. The total nationwide energy demands that would result from implementing the process vent and wastewater controls are around 1.18×10^{12} Btu annually.

7.4 COST IMPACTS

The impacts analysis was conducted on an actual facility-specific basis. A baseline level of control was established for each facility, and the first step in the cost analysis was to estimate which facilities would be required to install control to meet the provisions of the regulatory alternative. Table 7-2 shows, by emission source type, the number of facilities in each subcategory where it was predicted that controls would be required to meet the regulatory alternative. As pointed out in the primary environmental impacts section, the cost of control for process vents, storage tanks, and wastewater was the cost of controlling previously uncontrolled streams.

More explanation is necessary regarding equipment leaks. Subpart I of 40 CFR 63 requires that certain components in HAP service at styrene butadiene rubber and latex, polybutadiene rubber, and Hypalon® facilities comply with the Subpart H provisions (negotiated regulation for equipment leaks). For the styrene-butadiene rubber by emulsion and Hypalon® subcategories, it was estimated that there are no additional components in HAP service that are not now required to meet the Subpart H level. Therefore, no emission reductions are achieved, or costs incurred, at facilities in these two subcategories. This is also true for the covered components at styrene-butadiene latex, styrene-butadiene rubber by solution, and polybutadiene rubber by solution facilities. However, it was determined that there are components at facilities in these categories that are not covered. Emission reductions and the costs for these components, and for all other facilities, were calculated as the incremental emission reductions and costs between the existing control program and the Subpart H level. Six facilities did not report

TABLE 7-2. NUMBER OF FACILITIES WHERE CONTROL WILL BE REQUIRED TO MEET REGULATORY ALTERNATIVE LEVEL

Subcategory	Number of Facilities Where Control Will be Required				
	Storage	Front-End Process Vents	Back-End Process	Wastewater	Equipment Leaks
Butyl		1		1	1
Epichlorohydrin	1				1
Ethylene Propylene	1	2	1		5
Halobutyl	1	1			1
Hypalon®					
Neoprene		2			3
Nitrile Butadiene Latex				1	3
Nitrile Butadiene Rubber	1				1
Polybutadiene/Styrene Butadiene Rubber by Solution			2		5
Polysulfide					
Styrene Butadiene Latex		1		2	15
Styrene Butadiene Rubber by Emulsion			2	1	

any form of equipment leak control program, and they would achieve emission reductions and incur costs from an uncontrolled level.

The estimated total capital investments, total annual costs, and cost-effectiveness values are presented by subcategory in Table 7-3.

7.5 ECONOMIC IMPACTS

Economic impacts for the regulatory alternatives analyzed show that the estimated price increases for the affected chemicals range from 0.2 percent for NBL to 2.5 percent for BR. Estimated decreases in production range from 0.7 percent for NBL to 5.0 percent for BR. No closures of facilities are expected as a result of the standard.

Three aspects of the analysis will likely lead to an overestimate of the impacts. First, the economic analysis model assumes that all affected firms compete in a national market, though in reality some firms may be protected from competitors by regional or local trade barriers. Second, facilities with the highest control cost per unit of production are assumed to also have the highest baseline production costs per unit. This assumption may not always be true, because the baseline production costs per unit are not known, and thus, the estimated impacts, particularly for the smaller firms, may be too high. Finally, economic impacts may be overstated, because the alternative for halobutyl rubber and BR that was used in this analysis is more stringent and more costly than the selected regulatory alternative.

TABLE 7-3. SUMMARY OF REGULATORY ALTERNATIVE COSTS

		TCI (1000$)	TAC (1000$/yr)	AER (Mg/yr)	CE ($/Mg)
Butyl	RAlt1	$691	$1,316	606	$2,200
	RAlt2	$1,049	$2,192	753	$2,900 ($6,000)[a]
Epichlorohydrin		$491	$241	124	$1,900
Ethylene Propylene		$5,957	$3,732	2,087	$1,800
Halobutyl	RAlt1	$328	$322	335	$1,000
	RAlt2	$500	$1,117	384	$2,900 ($16,200)[a]
Hypalon®		$0	$0	0	na
Neoprene		$560	$897	354	$2,500
Nitrile Butadiene Latex		$465	$243	135	$1,800
Nitrile Butadiene Rubber		$397	$444	365	$1,200
Polybutadiene/ Styrene Butadiene Rubber by Solution		$11,780	$8,335	1,519	$5,500[b]
Polysulfide		$0	$0	0	na
Styrene Butadiene Latex		$1,480	$1,028	627	$1,600
Styrene Butadiene Rubber by Emulsion		$3,942	$2,112	243	$8,700[b]

[a] Incremental cost-effectiveness in going from Regulatory Alternative 1 (RAlt1) to Regulatory Alternative 2 (RAlt2).

[b] This cost-effectiveness is primarily due to the high costs estimated to control back-end process emissions. The costs developed are costs for incineration devices to sufficient back-end vents so that emissions will be reduced to a level equivalent to the level achieved by meeting the residual HAP limit by stripping. Extrapolation of industry estimates of the cost of enhanced stripping place the cost of enhanced stripping as low as 10 percent of the cost of incineration.

8.0 SELECTION OF THE STANDARDS

The purpose of this chapter is to provide the rationale for the selection of the standards for the elastomer production source categories. In order the provide background for the subsequent discussions, the first section of this chapter is a summary of the proposed rule. This is followed by a discussion of the rationale for the selection of various aspects of the standards including the source categories and pollutants to be regulated, the level and format of the standards, and the compliance, reporting, and recordkeeping provisions.

While this chapter includes rationale for the proposed standards for the elastomer source categories; the format, reporting, recordkeeping and compliance provisions of the proposed standards were primarily established by the methods used to determine MACT floors and regulatory alternatives. In other words, the decision to use the HON in determining the MACT floors and regulatory alternatives predetermined that standards for the elastomer source categories would resemble the HON. The rationale for the selection of the approach to determining MACT floors and regulatory alternatives is provided in Chapter 6.

8.1 SUMMARY OF THE PROPOSED STANDARDS

This section provides a summary of the proposed regulation. The full regulatory text is available in Docket No. A-92-44, directly from the EPA, or from the Technology Transfer Network (TTN) on the EPA's electronic bulletin boards. More information on how to obtain a copy of the proposed regulation are provided in the preamble for the proposed standards.

8.1.1 Source Categories to be Regulated

The proposed standards would regulate HAP emissions from facilities in one of the 12 elastomer subcategories presented in Chapter 5, provided that a facility is a major source or is located at a plant site that is a major source. For the proposed rule, an affected source is defined as one of the following:

- All HAP emission points at a facility producing butyl rubber that are associated with butyl rubber production,
- All HAP emission points at a facility producing epichlorohydrin elastomer that are associated with epichlorohydrin elastomer production,
- All HAP emission points at a facility producing ethylene propylene rubber that are associated with ethylene propylene rubber production,
- All HAP emission points at a facility producing halobutyl rubber that are associated with halobutyl rubber production,
- All HAP emission points at a facility producing Hypalon™ that are associated with Hypalon™ production,
- All HAP emission points at a facility producing neoprene that are associated with neoprene production,
- All HAP emission points at a facility producing nitrile butadiene latex that are associated with nitrile butadiene latex production,
- All HAP emission points at a facility producing nitrile butadiene rubber that are associated with nitrile butadiene rubber production,
- All HAP emission points at a facility producing polybutadiene rubber and/or styrene butadiene rubber using a solution process that are associated with production of polybutadiene rubber and/or styrene butadiene rubber using a solution process,
- All HAP emission points at a facility producing polysulfide rubber that are associated with polysulfide production,

- All HAP emission points at a facility producing styrene butadiene latex that are associated with styrene butadiene latex production, and
- All HAP emission points at a facility producing styrene butadiene rubber using an emulsion process that are associated with styrene butadiene rubber production using an emulsion process.

In addition, if a facility produces elastomer products from more than one subcategory in the same equipment, then that facility is a single affected source.

The EPA is aware of some polymeric resin and copolymer products that are manufactured using similar chemicals and processes that are in some ways similar to the processes used in the manufacture of the elastomers covered by the proposed rule. Several styrene butadiene, non-elastomers, resins, and copolymers are included in this group. The EPA does not intend for the proposed regulation to cover the production of these materials, which are often high conversion, block copolymers, with different end uses from the elastomers. However, the development of specific criteria to distinguish between elastomers and resins/copolymers has proven difficult. Therefore, the EPA is requesting comments on methods to clearly make this distinction.

8.1.2 Relationship to Other Rules

Sources subject to the proposed rule are also subject to other existing rules. In some cases, the proposed rule supersedes existing rules and affected sources are no longer required to comply with the existing rule. In other cases, there is no conflict between the existing rule and the proposed rule, and in these cases, the affected source must comply with both rules.

Sources subject to the proposed rule and subject to the NESHAP for Certain Processes Subject to the Negotiated Regulation for Equipment Leaks (40 CFR 63, subpart I) are required to continue to comply with subpart I until the compliance date of the proposed rule. After the compliance date of the proposed rule, compliance with the proposed rule will constitute compliance with subpart I.

Sources subject to the proposed rule may have storage vessels subject to the NSPS for Volatile Organic Liquid Storage Vessels (40 CFR 60, subpart Kb). After the compliance date for the proposed rule, such storage vessels are only subject to the proposed rule and are no longer required to comply with subpart Kb.

Sources subject to the proposed rule may have cooling towers subject to the NESHAP for Industrial Cooling Towers (40 CFR 63, subpart Q). There is no conflict between the requirements of subpart Q and the proposed rule. Therefore, sources subject to both rules must comply with both rules.

8.1.3 Pollutants to be Regulated

The source categories covered by the proposed rule emit a variety of HAP. The most significant emissions are of the following HAP: n-hexane, styrene, 1,3-butadiene, acrylonitrile, methyl chloride, hydrogen chloride, carbon tetrachloride, chloroprene, and toluene. The proposed standards would regulate emissions of these compounds, as well as all other HAP that are emitted.

8.1.4 Affected Emission Points

Emissions from the following types of emission points (i.e., emission source types) are being covered by the proposed rule: storage vessels, "front-end" process vents, process "back-end" operations, equipment leaks, and wastewater operations. The process "front-end" includes pre-polymerization, reaction, stripping, and material recovery operations; and the process "back-end" includes all operations after stripping (predominately drying and finishing).

8.1.5 Proposed Standards

The standards being proposed for storage vessels, continuous front-end process vents, equipment leaks, and wastewater are the same as those promulgated for the corresponding emission source types at facilities subject to the HON. Also included are standards for two emission source types not covered by the HON, batch front-end process vents and process back-end operations. The batch front-end process vent applicability and control requirements are based on the approach described in the Batch Processes ACT. The standards for process back-end emissions are primarily based on State permit conditions that restrict the amount of residual HAP in the raw polymer product that is sent to the back-end operations.

Tables 8-1 and 8-2 summarize the level of control being proposed for new and existing sources, respectively. Where the level of control is the same as the HON for storage vessels, equipment leaks, and wastewater, this is indicated in the table as "HON." When "HON/ACT" is used in the table, the level of control for continuous front-end process vents is equal to the HON level of control, and the level of control for batch front-end process vents is equal to the 90 percent control level from the Batch Processes ACT. The following sections describe the proposed standards in more detail, by emission source type.

8.1.5.1 Storage Vessels

For all subcategories, the storage vessel requirements are identical to the HON storage vessel requirements in subpart G. A storage vessel means a tank or other vessel that is associated with an elastomer product process unit and that stores a liquid containing one or more organic HAP. The proposed rule specifies assignment procedures for determining whether a storage vessel is associated with an elastomer product process unit. The storage vessel provisions do not apply to the following: (1) vessels permanently attached to motor vehicles, (2) pressure vessels designed to operate in excess of 204.9 kpa (29.7 psia), (3) vessels with capacities smaller than 38 m^3 (10,000 gal), (4) wastewater tanks, and (5) vessels storing liquids that contain organic HAP only as impurities. An impurity is produced coincidentally with another chemical substance and is processed, used, or distributed with it.

In addition to those vessels that do not meet the definition of storage vessels, the proposed standards exempt certain storage

TABLE 8-1. SUMMARY OF PROPOSED STANDARDS FOR EXISTING SOURCES

Subcategory	Level of Proposed Standard[a]				
	Storage	Front-End Process Vents	Back-End Process Emissions	Wastewater	Equipment Leaks
BR HBR	HON	HON/ACT, exempting halogenated vent streams controlled by flare or boiler before proposal date	no control	HON	HON
EPI, HYP, NEO, NBL, NBR, PSR, SBL	HON	HON/ACT	no control	HON	HON
EPR, PBR/SBRS, SBRE	HON	HON/ACT	MACT floor residual HAP limit	HON	HON

[a] HON = the level of the standard is equivalent to existing source provisions of subpart G of 40 CFR 63 for storage and wastewater, and subpart H of 40 CFR 63 for equipment leaks.

HON/ACT = the level of the standard for continuous front-end process vents is equal to the existing source process vent provisions in subpart G of 40 CFR 63, and the level of the standard for batch front-end process vents is equal to the 90 percent control level from the Batch Processes ACT.

TABLE 8-2. SUMMARY OF PROPOSED STANDARDS FOR NEW SOURCES

Subcategory	Level of Standard				
	Storage	Front-End Process Vents	Back-End Process Emissions	Wastewater	Equipment Leaks
BR, EPI, HBR, HYP, NEO, NBL, NBR, SBL	New Source HON	New Source HON/ACT	no control	New Source HON	New Source HON
EPR, PBR/SBRS, SBRE	New Source HON	New Source HON/ACT	New source floor residual HAP limit	New Source HON	New Source HON

[a] HON = the level of the standard is equivalent to new source provisions of subpart G of 40 CFR 63 for storage and wastewater, and subpart H of 40 CFR 63 for equipment leaks.

HON/ACT = the level of the standard for continuous front-end process vents is equal to the new source process vent provisions in subpart G of 40 CFR 63, and the level of the standard for batch front-end process vents is equal to the 90 percent control level from the Batch Processes ACT.

vessels containing latex. Specifically, storage vessels containing a latex, located downstream of the stripping operations, are exempt from the storage vessel requirements of the proposed rule.

The owner or operator must determine whether a storage vessel is Group 1 or Group 2; Group 1 storage vessels require control. The criteria for determining whether a storage vessel is Group 1 or Group 2 are shown in Table 8-3, and are the same as the HON criteria.

The storage provisions require that one of the following control systems be applied to Group 1 storage vessels: (1) an internal floating roof with proper seals and fittings; (2) an external floating roof with proper seals and fittings; (3) an external floating roof converted to an internal floating roof with proper seals and fittings; or (4) a closed vent system with a 95-percent efficient control device. The storage provisions give details on the types of seals and fittings required. Monitoring and compliance provisions include periodic visual inspections of vessels, roof seals, and fittings, as well as internal inspections. If a closed vent system and control device is used, the owner or operator must establish appropriate monitoring procedures. Reports and records of inspections, repairs, and other information necessary to determine compliance are also required by the storage provisions. No controls are required for Group 2 storage vessels.

8.1.5.2 Front-End Process Vents

There are separate provisions in the proposed rule for front-end process vents that originate from unit operations operated in a continuous mode, and those from unit operations operated in a batch mode. An affected source could be subject to both the continuous and batch front-end process vent provisions if front-end operations at an elastomer production process unit consist of a combination of continuous and batch unit operations. The continuous provisions would be applied to those vents from continuous unit operations, and the batch provisions to vents from batch unit operations.

TABLE 8-3. GROUP 1 STORAGE VESSEL CRITERIA

Vessel Capacity (cubic meters)	Vapor Pressure[a] (kilopascals)
Existing sources	
75 $\leq$ capacity < 151	$\geq$ 13.1
151 $\leq$ capacity	$\geq$ 5.2
New sources	
38 $\leq$ capacity < 151	$\geq$ 13.1
151 $\leq$ capacity	$\geq$ 0.7

[a]Maximum true vapor pressure of total organic HAP at storage temperature.

Continuous Front-End Process Vents. The provisions in the proposed rule for continuous front-end process vents are the same as the HON process vent provisions in subpart G. Continuous front-end process vents are gas streams that originate from continuously operated units in the front-end of an elastomer process, and include gas streams discharged directly to the atmosphere and gas streams discharged to the atmosphere after diversion through a product recovery device. The continuous front-end process vent provisions apply only to vents that emit gas streams containing more than 0.005 weight-percent HAP.

A Group 1 continuous front-end process vent is defined as a continuous front-end process vent with a flow rate greater than or equal to 0.005 scmm, an organic HAP concentration greater than or equal to 50 ppmv, and a total resource effectiveness (TRE) index value less than or equal to 1.0. The continuous front-end process vent provisions require the owner or operator of a Group 1 continuous front-end process vent stream to: (1) reduce the emissions of organic HAP using a flare; (2) reduce emissions of organic HAP by 98 weight-percent or to a concentration of 20 ppmv or less; or (3) achieve and maintain a TRE index above 1. Performance test provisions are included for Group 1 continuous front-end process vents to verify that the control device achieves the required performance.

The organic HAP reduction is based on the level of control achieved by the reference control technology. Group 2 continuous front-end process vent streams with TRE index values between 1.0 and 4.0 are required to monitor those process vent streams to ensure those streams do not become Group 1, which require control.

The owner or operator can calculate a TRE index value to determine whether each process vent is a Group 1 or Group 2 continuous front-end process vent, or the owner or operator can elect to comply directly with the control requirements without calculating the TRE index. The TRE index value is determined after the final recovery device in the process or prior to venting to the atmosphere. The TRE calculation involves an emissions test or engineering assessment and use of the TRE equations in section 63.115 of subpart G.

The rule encourages pollution prevention through product recovery because an owner or operator of a Group 1 continuous front-end process vent may add recovery devices or otherwise reduce emissions to the extent that the TRE becomes greater than 1.0 and the Group 1 continuous front-end process vent becomes a Group 2 continuous front-end process vent.

Group 1 halogenated streams controlled using a combustion device must vent the emissions from the combustor to an acid gas scrubber or other device to limit emissions of halogens prior to venting to the atmosphere. The control device must reduce the overall emissions of hydrogen halides and halogens by 99 percent or reduce the outlet mass emission rate of total hydrogen halides and halogens to less than 0.45 kg/hr.

The proposed rule exempts certain halogenated process vent streams from the requirement to control the halogens at the exit from a combustion device. Specifically, halogenated continuous front-end process vents at affected sources producing butyl or halobutyl rubber are exempt from the requirements to control hydrogen halides and halogens from the outlet of combustion devices. However, the proposed rule requires that these vent streams be controlled in accordance with the other Group 1 requirements for continuous front-end process vents.

Monitoring, reporting, and recordkeeping provisions necessary to demonstrate compliance are also included in the continuous front-end process vent provisions. Compliance with the monitoring provisions is based on a comparison of daily average monitored values to enforceable parameter "levels" established by the owner or operator. A difference in the proposed rule and the HON is that the procedure for determining the enforceable parameter monitoring level for continuous process vents is both more specific and restrictive than that in subpart G. Subpart G allows the use of engineering assessments and manufacturers' recommendations in establishing the enforceable level, while the proposed rule would require that the level be established entirely based on the monitoring conducted during the compliance test. The level is established as the average of the maximum (or minimum) monitored point values for the three test runs. That is, if the operating parameter to be established is a maximum, the value of the parameter shall be the average of the maximum values from each of the three test runs. Likewise, if the operating parameter to be established is a minimum, the value of the parameter shall be the average of the minimum values from each of the three test runs.

Batch Front-End Process Vents. Process vents that include gas streams originating from batch unit operations in the front-end of an elastomer product process unit are subject to the batch front-end process vent provisions of the proposed rule. Consistent with provisions in the proposed rule for other emission source types, batch front-end process vents are classified as Group 1 or Group 2, with control being required for Group 1 batch front-end process vents.

An important aspect of the batch front-end process vent provisions is that applicability is on an individual vent basis. All batch emission episodes that are emitted to the atmosphere through the vent are to be considered in the group determination. The proposed rule does not require that emissions from similar batch unit operations emitted from different vents be combined for applicability determinations. In other words, if a process included four batch reactors, and each reactor had a dedicated vent to the atmosphere, applicability would be determined for each reactor.

The applicability criteria of the batch front-end process vent provisions are from the Batch Processes ACT, and are based on volatility and annual emissions of the HAP emitted from the vent, and the average flow rate of the vent stream. The vent stream characteristics are determined at the exit from the batch unit operation before any emission control or recovery device. The proposed rule specifies that reflux condensers, condensers recovering monomer or solvent from a batch stripping operation, and condensers recovering monomer or solvent from a batch distillation operation are considered part of the unit operation. Therefore, the batch front-end process vent applicability criteria would be applied after these condensers.

The first step in the applicability determination is to calculate the annual HAP emissions. Annual HAP emissions may be calculated using equations contained in the regulation (which are from the Batch Processes ACT) and/or testing. Engineering assessment may also be used if the equations are not appropriate and testing is not feasible. Batch front-end process vents with annual HAP emissions less than 225 kilograms per year are exempt from all batch front-end process vent requirements, other than the requirement to estimate annual HAP emissions.

All batch front-end process vents with annual emissions greater than 225 kilograms per year are required to determine the volatility class of the vent. The volatility class of the batch front-end process vent is based on the weighted average vapor pressure of HAP emitted annually from the vent. There are three volatility classes - low, medium, and high, which are shown in Table 8-4.

There are two tiers of Group 2 batch front-end process vents. First, if the annual HAP emissions of a vent are below specified cutoff levels, the batch front-end process vent is classified as a Group 2 vent, and a batch cycle limitation must be established (discussed below). These cutoff emission levels are 11,800 kilograms HAP per year for low volatility vents, 7,300 kilograms HAP per year for medium volatility vents, and 10,500 kilograms HAP per year for high volatility vents.

If annual HAP emissions are greater than the cutoff emission levels specified above, the owner must determine the annual average flow rate of the batch front-end process vent, and the "cutoff flow rate" using the equation in the proposed rule for the appropriate volatility class. The Group 1/Group 2 classification is then based on a comparison between the actual annual average flow rate, and the cutoff flow rate. If the actual flowrate is less than the calculated cutoff flowrate, then the batch process vent is a Group 1 vent under the proposed

TABLE 8-4. BATCH FRONT-END PROCESS VENT VOLATILITY CLASSES

Vent Volatility Class	WAVP[a] kilopascals
low	< 10
moderate	$10 \leq vp < 20$
high	≥ 20

[a] Weighted average vapor pressure of batch front-end process vent.

standards, and control is required. If the actual flowrate is greater than the calculated cutoff flowrate, then the batch process vent is a Group 2 batch front-end process vent, and the owner or operator must establish a batch cycle limitation.

Owners and operators of Group 2 batch front-end process vents must establish a batch cycle limitation that ensures that HAP emissions from the vent do not increase to a level that would make the batch front-end process vent Group 1. The batch cycle limitation is an enforceable restriction on the number of batch cycles that can be performed in a year. An owner or operator has two choices regarding the level of the batch cycle limitation. The limitation may be set to maintain emissions below the annual emission cutoff levels listed above, or the limitation may be set to ensure that annual emissions do not increase to a level that makes the calculated cutoff flow rate increase beyond the actual annual average flow rate. The advantage to the first option is that the owner or operator would not be required to determine the annual average flow rate of the vent. A batch cycle limitation does not limit production to any previous production level, but is based on the number of cycles necessary to exceed one of the two batch front-end process vent applicability criteria discussed above.

The batch front-end process vent provisions require the owner or operator of a Group 1 batch front-end process vent stream to: (1) reduce the emissions of organic HAP using a flare or (2) reduce emissions of organic HAP by 90 weight-percent over each batch cycle using a control or recovery device. If a halogenated batch vent stream (defined as a vent that has a mass emission rate of halogen atoms in organic compounds of 3,750 kilograms per year or greater) is sent to a combustion device, the outlet stream must be controlled to reduce emissions of hydrogen halides and halogens by 99 percent. Control could be achieved at varying levels for different emission episodes as long as the required level of control for the batch cycle was achieved. The owner or operator could even elect to control some emission episodes and by-pass control for others. Performance test provisions are included for Group 1 batch front-end process vents to verify that the control device achieves the required performance.

Monitoring, reporting, and recordkeeping provisions necessary to demonstrate compliance are also included in the batch front-end process vent provisions. These provisions are modeled after the analogous continuous process vent provisions in the HON. Compliance with the monitoring provisions is based on a comparison of batch cycle daily average monitored values to enforceable parameter monitoring levels established by the owner or operator.

The proposed provisions for batch front-end process vents contain three conditions that can greatly simplify compliance. First, an owner or operator can control a batch front-end process vent in accordance with the Group 1 batch front-end process vent requirements and bypass the applicability determination. Second, if a batch front-end process vent is combined with a continuous vent stream before a recovery or control device, the owner or operator is exempt from all batch front-end process vent requirements. However, applicability determinations, tests, etc. for the continuous vent must be conducted at conditions when the addition of the batch vent streams makes the HAP concentration in the combined stream greatest. Finally, if batch front-end process vents combined to create a "continuous" flow to a control or recovery device, the less complicated continuous process vent monitoring requirements are used.

8.1.5.3 Process Back-End Operations

Process back-end operations include all operations at an elastomer product process unit that occur after the stripping operations. These operations include, but are not limited to, filtering, drying, separating, and other finishing operations, as well as crumb storage.

The back-end process provisions contain residual HAP limitations for three subcategories: ethylene propylene rubber (EPR), polybutadiene rubber and/or styrene butadiene rubber by solution (PBR/SBRS), and styrene butadiene rubber by emulsion

(SBRE). The limitations for EPR and PBR/SBRS are in units of kilograms HAP per megagram of crumb rubber dry weight (crumb rubber dry weight means the weight of the polymer, minus the weight of water, residual organics, carbon black, and extender oils), and the limitation for SBRE is in units of kilogram HAP per megagram latex. The limitation is a weekly average weighted based on the weight of rubber or latex processed in the stripper. Two methods of compliance are available: (1) stripping the polymer to remove the residual HAP to the levels in the standards, on a weekly weighted average basis, or (2) reducing emissions using add-on control to a level equivalent to the level that would be achieved if stripping was used.

Compliance Using Stripping Technology. If stripping is the method of compliance selected, the proposed rule allows two options for demonstrating compliance: by sampling and by monitoring stripper operating parameters. If compliance is demonstrated by sampling, samples of the stripped wet crumb or stripped latex must be taken immediately after the stripper and analyzed to determine the residual HAP content. The preamble for the proposed standards specifically requests comments on the safety aspects associated with the sampling location of the wet crumb or stripped latex. A sample must be taken once per grade per day or once per batch per day. The sample must be analyzed to determine the residual HAP content, and the corresponding weight of rubber or latex processed in the stripper must be recorded. This information is then used to calculate a weekly weighted average. A weekly weighted average that is above the limitation is a violation of the standard, as is a failure to sample and analyze at least 75 percent of the samples required during the week. The EPA has developed test methods that would be used to determine compliance with the standard; which are being proposed separately. Records of each test result would be required, along with the corresponding weight of the polymer processed in the stripper. Records of the weekly weighted averages must also be maintained.

An owner or operator complying using stripping can also demonstrate compliance by continuously monitoring stripper operating parameters. If using this approach, the owner or operator must establish stripper operating parameters for each grade of polymer processed in the stripper, along with the corresponding residual HAP content of that grade. The parameters that must be monitored include, at a minimum, temperature, pressure, steaming rates (for steam strippers), and some parameter that is indicative of residence time. The HAP content of the grade must be determined initially using the proposed residual HAP test methods discussed above. The owner or operator can elect to establish a single set of stripper operating parameters for multiple grades.

A difference in the demonstration of compliance by sampling, and the demonstration of compliance by monitoring stripping parameters, is that the monitoring option is entirely based on a grade or batch. To further explain, if a particular grade of polymer is processed in the stripper continuously for 32 hours, and if the sampling compliance demonstration option is selected, a sample of that grade is required to be taken each operating day. However, if the stripping parameter monitoring option is selected, the entire length of time the grade is being processed in the stripper is treated as a single unit.

During the operation of the stripper, the parameters must be continuously monitored, with a reading of each parameter taken at least once every 15 minutes. If, during the processing of a grade, all hourly average parameter values are in accordance with the established levels, the owner or operator can use the HAP content determined initially in the calculation of the weekly weighted average, and sampling is not required. However, if one hourly average value for any parameter is not in accordance with the established operating parameter, a sample must be taken and the HAP content determined using the proposed test methods to be used in calculating the weekly weighted average.

Records of the initial residual HAP content results, along with the corresponding stripper parameter monitoring results for the sample, must be maintained. The hourly average monitoring results are required to be maintained, along with the results of any HAP content tests conducted due to exceedance of the established parameter monitoring levels. Records must also be kept of the weight of polymer processed in each grade, and the weekly weighted average values.

If complying with the residual HAP limitations using stripping technology, and demonstrating compliance by monitoring stripper parameters, there are three ways a facility can be in violation of the standard. First, a weekly weighted average that is above the limitation is a violation of the standard, as is a failure to sample and analyze a sample for a grade with an hourly average parameter value not in accordance with the established monitoring parameter levels. The third means for a facility to be out of compliance is if the stripper monitoring data are insufficient for less than 75 percent of the grades produced during the week. Stripper data are considered insufficient if monitoring parameters are obtained for less than 75 percent of the 15 minute periods during the processing of a grade.

<u>Compliance Using Add-On Control</u>. If add-on control is the method of compliance selected, there are two levels of compliance. Initial compliance is based on a source test, and continuous compliance is based on the daily average of parameter monitoring results for the control or recovery device.

The initial performance test must consist of three 1-hour runs or three complete batch cycles, if the duration of the batch cycle is less than 1 hour. The test runs must be conducted during processing of "worst-case" grade, which means the grade with the highest residual HAP content leaving the stripper. The "uncontrolled" residual HAP content in the latex or wet crumb rubber must be determined, using the proposed test methods, after the stripper. Then, when the crumb for which the uncontrolled residual HAP was determined is being processed in the back-end unit operation being controlled, the inlet and outlet emissions for the control or recovery device must be determined using Method 18. The uncontrolled HAP content is then adjusted to account for the reduction in emissions by the control or recovery device, and compared to the levels in the standard. For initial compliance, the adjusted residual HAP content level for each test run must be less than the level in the proposed standards.

During the initial test, the appropriate parameter must be monitored, and an enforceable "level" established as a maximum or minimum operating parameter based on this monitoring. As with continuous front-end process vents, the level is established as the average of the maximum (or minimum) point values for the three test runs.

Continuous monitoring must be conducted on the control or recovery device, and compliance is based on the daily average of the monitoring results. The monitoring, recordkeeping, and reporting provisions are the same as the process vent provisions in the HON, which are required for continuous front-end process vents in the proposed standard.

Carbon disulfide limitations for styrene butadiene rubber by emulsion producers. The proposed regulation would reduce carbon disulfide (CS_2) emissions from styrene butadiene rubber producers using an emulsion process by limiting the concentration of CS_2 in the dryer vent stacks to 10 ppmv. Sulfur-containing shortstopping agents used to produce certain grades of rubber have been determined to be the source of CS_2 in the dryer stacks. Owners or operators would be required to develop standard operating procedures for each grade that uses a sulfur-containing shortstopping agent. These standard operating procedures would specify the type and amount of agent added, and the point in the process where the agent is added. One standard operating procedure can be used for more than one grade if possible.

For each standard operating procedure, the owner or operator would be required to conduct a performance test to measure the concentration of CS_2 in the dryer stack(s). A particular standard operating procedure would be acceptable if the average CS_2 concentration for the three required test runs was less than 10 ppmv. The facility would be in compliance with this section of the proposed regulation if the appropriate standard operating procedure is followed whenever a sulfur-containing shortstopping agent is used. Facilities that route dryer vents to a combustion device would be exempt from this section of the regulation.

8.1.5.4 Wastewater Operations

For all subcategories, the wastewater provisions are identical to the wastewater provisions in subparts F and G. The proposed rule applies to any organic HAP-containing water, raw material, intermediate, product, by-product, co-product, or waste material that exits any elastomer production process unit equipment and has either (1) a total volatile organic HAP concentration of 5 ppmw or greater and a flow rate of 0.02 ℓpm or greater; or (2) a total volatile organic HAP concentration of 10,000 ppmw or greater at any flow rate. "Wastewater," as defined in section 63.101 of subpart F, encompasses both maintenance wastewater and process wastewater. The process wastewater provisions also apply to organic HAP-containing residuals that are generated from the management and treatment of Group 1 wastewater streams. Examples of process wastewater streams include, but are not limited to, wastewater streams exiting process unit equipment (e.g., decanter water, such as condensed steam used in the process), feed tank drawdown, vessel washout/cleaning that is part of the routine batch cycle, and residuals recovered from waste management units. Examples of maintenance wastewater streams are those generated by descaling of heat exchanger tubing bundles, cleaning of distillation column traps, and draining of pumps into an individual drain system. Wastewater streams generated downstream of the stripper (i.e., back-end wastewater streams) located at facilities that are subject to a back-end emission limitation, are exempt from the wastewater requirements.

Maintenance wastewater. For maintenance wastewater, the proposed rule incorporates the requirements of section 63.105 of subpart F for maintenance wastewater. This requires owners or operators to prepare a description of procedures that will be used to manage HAP-containing wastewater created during maintenance activities, and to implement these procedures.

Process wastewater. The Group 1/Group 2 approach is also used for the HON process wastewater provisions, with Group 1 process wastewater streams requiring control. For existing sources, a Group 1 wastewater stream is one with an average flow rate greater than or equal to 10 liters per minute and a total VOHAP average concentration greater than or equal to 1,000 parts per million by weight. For new sources, a Group 1 wastewater stream is one with an average flow rate greater than or equal to 0.02 liter per minute and an average concentration of 10 parts per million by weight or greater.

An owner or operator may determine the VOHAP concentration and flow rate of a wastewater stream either (1) at the point of generation; or (2) downstream of the point of generation. If wastewater stream characteristics are determined downstream of the point of generation, an owner or operator must make corrections for losses by air emissions; reduction of VOHAP concentration or changes in flow rate by mixing with other water or wastewater streams; and reduction in flow rate or VOHAP concentration by treating or otherwise handling the wastewater stream to remove or destroy HAP. An owner or operator can determine the flow rate and VOHAP concentration for the point of generation by (1) sampling; (2) using engineering knowledge; or (3) using pilot-scale or bench-scale test data. Both the applicability determination and the Group 1/Group 2 determination must reflect the wastewater characteristics before losses due to volatilization, a concentration differential due to dilution, or a change in VOHAP concentration or flow rate due to treatment.

There are instances where an owner or operator can bypass the group determination. An owner or operator is allowed to designate a wastewater stream or mixture of wastewater streams to be a Group 1 wastewater stream without actually determining the flow rate and VOHAP concentration for the point of generation. Using this option, an owner or operator can simply declare that a wastewater stream or mixture of wastewater streams is a Group 1 wastewater stream and that the emissions from the stream(s) are controlled from the point of generation through treatment. An owner or operator is required to determine the wastewater stream characteristics (i.e., VOHAP concentration and flow rate) for the designated Group 1 wastewater stream in order to establish the treatment requirements in section 63.138. Also, an owner or operator who elects to use the process unit alternative in section 63.138(d) of subpart G or the 95-percent biological treatment option in section 63.138(e) of subpart G is not required to make a Group 1/Group 2 determination.

Controls must be applied to Group 1 wastewater streams, unless the source complies with the source-wide mass flow rate provisions of sections 63.138(c)(5) or (c)(6) of subpart G; or implements process changes that reduce emissions as specified in section 63.138(c)(7) of subpart G. Control requirements include (1) suppressing emissions from the point of generation to the treatment device; (2) recycling the wastewater stream or treating the wastewater stream to the required Fr values for each HAP as listed in table 9 of subpart G (The required Fr values in table 9 of subpart G are based on steam stripping); (3) recycling any residuals or treating any residuals to destroy the total combined HAP mass flow rate by 99 percent or more; and (4) controlling the air emissions generated by treatment processes. While emission controls are not required for Group 2 wastewater streams, owners or operators may opt to include them in management and treatment options.

Suppression of emissions from the point of generation to the treatment device will be achieved by using covers and enclosures and closed vent systems to collect organic HAP vapors from the wastewater and convey them to treatment devices. Air emissions routed through closed-vent systems from covers, enclosures, and treatment processes must be reduced by 95 percent for combustion or recovery devices; or to a level of 20 ppmv for combustion devices.

The treatment requirements are designed to reduce the HAP content in the wastewater prior to placement in units without air emissions controls, and thus to reduce the HAP emissions to the atmosphere. The final rule provides several compliance options, including percent reduction, effluent concentration limitations, and mass removal.

For demonstrating compliance with the various requirements, owners or operators have a choice of using a specified design, conducting performance tests, or documenting engineering calculations. Appropriate compliance, monitoring, reporting, and recordkeeping provisions are included in the regulation.

8.1.5.5 Equipment Leaks

The equipment leak provisions in the proposed rule refer directly to the requirements contained in subpart H. In fact, many of the elastomer facilities are already subject to subpart H requirements through subpart I. Following is a summary of the subpart H requirements.

The standards would apply to equipment in organic HAP service 300 or more hours per year that is associated with a elastomer product process unit, including valves, pumps, connectors, compressors, pressure relief devices, open-ended valves or lines, sampling connection systems, instrumentation systems, surge control vessels, bottoms receivers, and agitators. The provisions also apply to closed vent systems and control devices used to control emissions from any of the listed equipment.

Pumps and valves. The proposed standard requires leak detection and repair for pumps in light liquid service and for valves in gas or light liquid service. Standards for both are implemented in three phases. The first and second phases for both types of equipment consist of a leak detection and repair (LDAR) program, with lower leak definitions in the second phase. The LDAR program involves a periodic check for organic vapor leaks with a portable instrument; if leaks are found, they must be repaired within a certain period of time. In the third phase, the periodic monitoring (a work practice standard) is combined with a performance requirement for an allowable percent leaking components.

The standard requires monthly monitoring of pumps using an instrument and weekly visual inspections for indications of leaks. In the first two phases of the valve standard, quarterly monitoring is required. In phase three, semiannual or annual monitoring may be used by process units with less than 1 percent and less than 0.5 percent leaking valves, respectively.

In phase three, if the base performance levels for a type of equipment are not achieved, owners or operators must, in the case of pumps, enter into a quality improvement program (QIP), and in the case of valves may either enter into a QIP or implement monthly LDAR. The QIP is a concept that enables plants exceeding the base performance levels to eventually achieve the desired levels without incurring penalty or being in a noncompliance status. As long as the requirements of the QIP are met, the plant is in compliance. The basic QIP consists of information gathering, determining superior performing technologies, and replacing poorer performers with the superior technologies until the base performance levels are achieved.

Connectors. The rule also requires leak detection and repair of connectors in gas or light liquid service. The monitoring frequency for connectors is determined by the percent leaking connectors in the process unit and the consistency of performance. Process units that have 0.5 percent or greater leaking connectors are required to monitor all connectors annually. Units that have less than 0.5 percent may monitor biannually and units that show less than 0.5 percent for two monitoring cycles may monitor once every 4 years.

Other Equipment. Subpart H also contains standards for other types of equipment. compressors, open-ended lines, pressure relief devices, and sampling connection systems. Compressors are required to be controlled using a barrier-fluid seal system, by a closed vent system to a control device, or must be demonstrated to have no leaks greater than 500 ppm. Open-ended lines must be capped or plugged. Pressure relief devices are required to be controlled using a closed vent system to a control device, a rupture disk, or must be demonstrated to have no leaks greater than 500 ppm HAP. Sampling connections must be a closed-purge or closed-loop system, or must be controlled using a closed vent system to a control device. Agitators must either be monitored for leaks or use systems that are better designed, such as dual mechanical seals. Pumps, valves, connectors, and agitators in heavy liquid service; instrumentation systems; and pressure relief devices in liquid service are subject to instrument monitoring only if evidence of a potential leak is found through sight, sound, or smell. Instrumentation systems consist of smaller pipes and tubing that carry samples of process fluids to be analyzed to determine process operating conditions or systems for measurement of process conditions.

Surge control vessels and bottoms receivers are required to be controlled using a closed vent system vented to a control device. However, the applicability of controls to surge control vessels and bottoms receivers is based on the size of the vessel and the vapor pressure of the contents. Controls are required for surge control vessels and bottoms receivers meeting the criteria for Group 1 storage vessels. Further, in the proposed elastomer production provisions, surge control vessels and bottoms receivers located downstream from the stripper, that contain latex, are exempt from the equipment leak provisions.

Other provisions. Under certain conditions delay of repair beyond the required period may be acceptable. Examples of these situations include where: (1) a piece of equipment cannot be repaired without a process unit shutdown, (2) equipment is taken out of organic HAP service, (3) emissions from repair will exceed emissions from delay of repair until the next shutdown, and (4) equipment with better leak performance such as pumps with single mechanical seals are replaced with dual mechanical seals.

In addition, specific alternative standards are included for batch processes and enclosed buildings. For batch processes, the owner or operator can choose either to meet similar standards to those for continuous processes with monitoring frequency pro-rated to time in use of organic HAP, or to periodically pressure test the entire system. For enclosed buildings, the owner or operator may forego monitoring if the building is kept under a negative pressure and emissions are routed through a closed vent system to an approved control device.

The equipment leak standards require the use of Method 21 of appendix A of part 60 to detect leaks. Method 21 requires a portable organic vapor analyzer to monitor for leaks from equipment in use. Test procedures using either a gas or a liquid for pressure testing the batch system are specified to detect for leaks.

The standards would require certain records to demonstrate compliance with the standard and the records must be retained in a readily accessible recordkeeping system. Subpart H requires that records be maintained of equipment that would be subject to the standards, testing associated with batch processes, design specifications of closed vent systems and control devices, test results from performance tests, and information required by equipment in QIP.

8.1.5.6 Emissions Averaging

The proposed standards would apply basically the same emissions averaging scheme as has been adopted by the HON, although the emissions averaging provisions of the proposed rule are entirely contained in the proposed rule instead of referring to the subpart G emissions averaging provisions. Only owners or operators of existing sources may use emissions averaging. All HAP emissions, except those from batch front-end process vents, equipment leaks, and wastewater streams treated in a biological treatment unit, are allowed to be included in the average, but the emissions average can only include 5 emission points (this is increased to 8 emission points where pollution prevention measures are used to control emission points to be included in an average).

The owner or operator must identify all the emission points that would be included in an emissions average and estimate their allowable and actual emissions using the reference efficiencies of the reference control technologies for each kind of emission point.

For each Group 1 point, the allowable emissions level is the emissions remaining after application of a reference control technology. As a result, all Group 1 emission points that are not being controlled with the reference control technology or a control measure achieving an equivalent reduction are emitting more than their allowable emissions. These points are generating emission "debits." Emission debits are calculated by subtracting the amount of emissions allowed by the standard for a given emission point from the amount of actual emissions for that point. If a Group 1 emission point is controlled by a device or a pollution prevention measure that does not achieve the control level of the reference control technology, the amount of emission debits will be based on the difference between the actual control level being achieved and what the reference control would have achieved. Equations for calculating debits are provided in the proposed rule.

The owner or operator must control other emission points to a level more stringent than what is required for that kind of point to generate emission "credits." Emission credits are calculated by subtracting the amount of emissions that actually exist for a given emission point from the amount of emissions that would be allowed by the rule, and then applying a 10-percent discount factor. If credits are generated through the use of a pollution prevention measure, no discount factor is applied. Equations for calculating credits are also provided the proposed rule. To be in compliance, the owner or operator must be able to show that the source's emission credits were greater than or equal to its emission debits.

Credits may come from: (1) control of Group 1 emission points using technologies that the EPA has rated as being more effective than the appropriate reference control technology; (2) control of Group 2 emission points; and (3) pollution prevention projects that result in control levels more stringent than what the standard requires for the relevant point or points.

A reference control technology cannot be used to generate credits beyond its assigned efficiency. For a new control technology or work practice, either the EPA or the permit authority must determine its control efficiency before it can be used to generate credits.

8.1.5.7 Recordkeeping and reporting requirements

Specific recordkeeping and reporting requirements related to each emission source type are included in the applicable sections of the proposed rule. Section 63.491 of the proposed rule provides general reporting, recordkeeping, and testing requirements.

The general reporting, recordkeeping, and testing requirements of this subpart are very similar to those found in subparts F and G. The proposed rule also incorporates provisions of subpart A of part 63. A table included in the proposed rule designates which sections of subpart A apply to the proposed rule.

The proposed rule requires sources to keep records and submit reports of information necessary to determine applicability and document compliance. The proposed rule requires retention of hourly average values (or batch cycle average values) of monitored parameters for operating days when there is not an excursion. If there is a monitoring parameter excursion, the 15-minute values for the excursion period must be retained. The proposed rule also requires that records of all residual HAP content test results. Records must be kept for 5 years.

Section 63.491 of the proposed rule lists the following types of reports that must be submitted to the Administrator as appropriate: (1) Initial Notification, (2) Application for Approval of Construction or Reconstruction, (3) Implementation Plan (if an operating permit application has not been submitted, (4) Emissions Averaging Plan, (5) Notification of Compliance Status, (6) Periodic Reports, and (7) other reports. The requirements for each of the seven types of reports are summarized below.

In addition, section 63.491 incorporates the reporting requirements of Subpart H, which requires owners and operators to submit three types of reports: (1) an Initial Notification; (2) a Notification of Compliance Status; and (3) Periodic Reports.

Initial Notification. The Initial Notification is due 120 days after the date of promulgation for existing sources. For new sources, it is due 180 days before commencement of construction or reconstruction, or 45 days after promulgation, whichever is later. Owners or operators can submit one Initial Notification to comply with both the requirements of section 63.491 of the proposed rule and the requirements of subpart H. The notification must list the elastomer processes that are subject to the proposed rule, and which provisions may apply (e.g., storage vessels, continuous front-end process vents, batch front-end process vents, back-end process, wastewater, and/or equipment leak provisions). A detailed identification of emission points is not necessary for the Initial Notification. The notification, however, must include a statement of whether the source expects that it can achieve compliance by the specified compliance date.

Application for Approval of Construction or Reconstruction. The proposed rule requires that the owners or operator comply with section 63.5 of subpart A regarding the application for approval of construction or reconstruction, with one exception. The information required to be included in the Implementation Plan must be submitted as part of the application for approval of construction or reconstruction.

Implementation Plan. The Implementation Plan details how the source plans to comply. An Implementation Plan would be required only for sources that have not yet submitted an operating permit application.

The Implementation Plan would be due 12 months prior to the date of compliance. While new sources are not required to submit an Implementation Plan, the same information is required to be submitted with the Application for Approval of Construction or Reconstruction. The information in the Implementation Plan should be incorporated into the source's operating permit application. The terms and conditions of the plan, as approved by the permit authority, would then be incorporated into the operating permit.

The Implementation Plan would include a list of emission points subject to the storage vessels, continuous front-end process vents, batch front-end process vents, wastewater operations, and equipment leak provisions and, as applicable, whether each emission point (e.g., storage vessel or process vent) is Group 1 or Group 2. The control technology or method of compliance planned for each Group 1 emission point must be specified. In addition, the Implementation Plan must identify if the facility has back-end process emission operations that are subject to a back-end emission limitation. If the facility is subject to a back-end emission limitation, the owner or operator must specify if compliance will be achieved using stripping technology or add-on control. Additionally, the owner or operator must specify if continuous compliance using stripping technology will be demonstrated by sampling or by monitoring stripper parameters.

The plan must also certify that appropriate testing, monitoring, reporting, and recordkeeping will be done for each Group 1 emission point of subject process back-end. If a source requests approval to monitor a unique parameter, a rationale must be included.

Emissions Averaging Plan. The Emissions Averaging Plan would be due 18 months prior to the date of compliance. New sources are not allowed to comply through the use of emissions averaging.

For points included in emissions averaging, the Emissions Averaging Plan would include: an identification of all points in the average and whether they are Group 1 or Group 2 points; the specific control technique or pollution prevention measure that will be applied to each point; the control efficiency for each control used in the average; the projected credit or debit generated by each point; and the overall expected credits and debits. The plan must also certify that the same types of testing, monitoring, reporting, and recordkeeping that are required by the proposed rule for Group 1 points will be done for all points (both Group 1 and Group 2) included in an emissions average. If a source requests approval to monitor a unique parameter or use a unique recordkeeping and reporting system, a rationale must be included in the Emissions Averaging Plan.

Notification of Compliance Status. The Notification of Compliance Status would be required 150 days after the source's compliance date. It contains the information for Group 1 emission points, back-end process operations using add-on control, and for all emission points in emissions averages, necessary to demonstrate that compliance has been achieved. Such information includes, but is not limited to, the results of any performance tests for continuous and/or batch process vents, and wastewater emission points; one complete test report for each test method used for a particular kind of emission point; TRE determinations for process vents; group determinations for batch process vents; design analyses for storage vessels and wastewater emission points; monitored parameter levels for each emission point and supporting data for the designated level; and values of all parameters used to calculate emission credits and debits for emissions averaging. The Notification of Compliance Status required by subpart H must be submitted within 90 days after the compliance date.

Periodic Reports. Generally, Periodic Reports would be submitted semiannually. However, there are two exceptions. First, quarterly reports must be submitted for all points included in an emissions average. Second, if monitoring results show that the parameter values for an emission point are above the maximum or below the minimum established levels for more than 1 percent of the operating time in a reporting period, or the monitoring system is out of service for more than 5 percent of the time, the regulatory authority may request that the owner or operator submit quarterly reports for that emission point. After 1 year, semiannual reporting can be resumed, unless the regulatory authority requests continuation of quarterly reports.

All Periodic Reports would include information required to be reported under the recordkeeping and reporting provisions for each emission point. For emission points involved in emissions averages, the report would include the results of the calculations of credits and debits for each month and for the quarter.

For continuously monitored parameters, the Periodic Report must report when "excursions" occur. Table 8-5 shows what constitutes an excursion. A significant difference exists between the proposed rule and the HON. In the HON, a source was allowed a certain number of "excused" excursions each semi-annual period before the source was determined to be out of compliance. In the proposed rule, the owner or operator is out of compliance with the provisions of this subpart for each excursion.

Periodic Reports would also include results of any performance tests conducted during the reporting period and instances when required inspections revealed problems. Additional information the source is required to report under its operating permit or Implementation Plan would also be described in Periodic Reports.

Periodic Reports for subpart H must be submitted every 6 months, and must contain summary information on the leak detection and repair program, changes to the process unit, changes in monitoring frequency or monitoring alternatives, and/or initiation of a QIP.

Other reports. Other reports required under the proposed rule include: reports of startup, shutdown, and malfunction; process changes that change the compliance status of process vents; and requests for extensions of repair and notifications of inspections for storage vessels and wastewater.

In addition, quarterly reporting of the number of batch cycles accomplished for Group 2 batch process vents is required. Every fourth quarterly report would be required to include the total batch cycles accomplished during the previous 12 months, and a statement whether the owner or operator is in compliance with the batch cycle limitation.

TABLE 8-5. SUMMARY OF EXCURSIONS

Emission Source Type	Type of Excursion	Description of Excursion
Continuous Front-End Process Vents	Daily average exceedance	When the daily average of a monitored parameter is above the maximum, or below the minimum, established level.
	Insufficient monitoring data	Insufficient monitoring data is when an owner or operator fails to obtain a valid hour of data for at least 75 percent of the operating hours during an operating day. Four 15-minute parameter measurements must be obtained to constitute a valid hour of data.
Batch Front-End Process Vents	Batch cycle daily average exceedance	When the daily average of a monitored parameter is above the maximum, or below the minimum, established level.
	Insufficient monitoring data	Insufficient monitoring data is when an owner or operator fails to obtain valid parameter measurements for at least 75 percent of the 15-minute periods during all controlled batch cycles during an operating day.
Back-End Process Operations compying by stripping/sampling	Weekly weighted average	When the weekly weighted average HAP content of polymers processed is above the level in the standard.
	Insufficient sampling data	Insufficient sampling data is when an owner or operator fails to sample and/or analyze the residual HAP content for at least 75 percent of the times during the week when sampling is required.
Back-End Process Operations compying by stripping/stripper parameter monitoring	Weekly weighted average	When the weekly weighted average HAP content of polymers processed is above the level in the standard.
	Failure to sample	When a sample is not taken and analyzed in situations where a one hourly average stripper parameter value is not in accordance with the established parameter level.
	Insufficient stripper monitoring data	Insufficient stripper monitoring data is when an owner or operator fails to obtain valid stripper monitoring data for at least 75 percent of grades or batches processing during the week. Stripper operating parameter measurements must be obtained for at least 75 percent of the 15-minute periods during the processing of a grade or batch to constitute valid stripper monitoring data.

8.2 RATIONALE FOR THE SELECTION OF SOURCE CATEGORIES

The nine source categories selected for the development of this proposed rule are listed in the source category list published on July 16, 1992 (57 FR 3156). Information gathered during the development of this proposed rule indicated that facilities in these nine source categories are major sources. In developing standards, the EPA has the discretion to (1) distinguish among class, types, and sizes of sources within a source category and (2) combine source categories. Criteria that may be considered in defining categories of similar sources include similarities in process operations (including differences between batch and continuous operations), emissions characteristics, control device applicability and costs, safety, and pollution prevention opportunities.

The way in which source categories or subcategories are defined is important, because it dictates the basis upon which the MACT floor is to be determined. The definition of the source category or subcategory describes the "pool" of facilities that can be used to define the MACT floor. This means that the MACT floor must be determined on the same basis upon which the source category is defined. The definition of the source category or subcategory is also important in that it limits the scope of emissions averaging; collocated emission points cannot be averaged unless they belong to the same source category.

8.2.1 Options for Source Categories

In determining how to aggregate or distinguish among the nine source categories, the EPA considered three options. The three options considered were: (1) the subcategory, (2) the source category, and (3) a single "super" source category composed of all nine Group I source categories. As discussed in Chapter 4, subcategories were created when process operations, emission characteristics, etc. distinguish one group of facilities within a source category from another group within the same source category. In determining the source category option, the EPA considered similarities and dissimilarities in process operations and resultant emissions, the controls that can be applied and how the similarities/dissimilarities affect these controls, and, to a much lesser degree, the amount of subcategories at each plant site and the potential for emission averaging. The EPA selected the subcategory option (Option 1) for the reasons discussed below.

The "super" source category option (Option 3) was rejected for two reasons. First, creating a super source category would have grouped too many dissimilar processes together, which would have resulted in MACT floor determinations inappropriate for and not representative of some of the processes. This would especially be true when determining the emission limitations for the process back-end, since the ability to control back-end process emissions is extremely product-specific. Second, the super source category option was not reasonable given the available data. Using this option would have discounted a large amount of data that showed distinctions between the subcategories. For these reasons, the EPA rejected this option for defining the source categories.

The source category option (Option 2) would be consistent with the source category listing, would provide some facilities additional opportunity to emissions average, and would avoid some of the problems of Option 3 by reducing the grouping of dissimilar processes. However, as discussed in Chapter 4, even within source categories, there are different process technologies and raw material usages that make division of source categories into subcategories more defensible for determining MACT floors. In addition, only one facility would have benefited from emissions averaging under Option 2. Therefore, the EPA determined that the subcategory option (Option 1) was the best option for defining the affected source.

Another source category decision was related to the production of polymeric resin and copolymer materials that are manufactured using similar chemicals and processes that are in some ways similar to the processes used in the manufacture of the elastomers covered by the proposed rule. During the course of studying the elastomer industry, the EPA became aware that the manufacture of some polymeric resins and copolymers can be somewhat similar to the manufacture of the elastomers covered by the proposed rule. Several styrene butadiene, non-elastomer, resins, and copolymers are included in this group. During the initial information gathering portion of this project, data were obtained from a few of these facilities. The general processes were in some ways similar to elastomer production processes, but significant differences exist in the final products and in HAP emissions. Further, because the EPA did not originally consider these producers to be part of the styrene butadiene rubber source category, information was only obtained for a portion of the industry. Therefore, the EPA decided that the production of styrene butadiene resins and copolymers should not be covered by the proposed elastomer regulation.

8.2.2 Emissions Averaging

As discussed in section 8.1.5.7, the proposed standards include provisions for emissions averaging that are essentially the same as those found in the HON. Under the proposed standards, emissions averaging would be allowed among existing emission points at the same plant site belonging to the same affected source. As discussed in section 8.1.1, an affected source generally includes each process unit at a plant site in the same subcategory. However, the affected source can include more than one process units if the same equipment is used for more than one subcategory. For the purposes of the following discussion, the term subcategory also refers to affected sources that include more than one subcategory.

In considering the use of emissions averaging, the EPA agreed that emissions averages should achieve at least a comparable hazard and risk benefit to point-by-point compliance. Sources who elect to use emissions averaging must demonstrate, to the satisfaction of the implementing agency, that compliance through averaging would not result in greater hazard or risk than compliance without averaging. Further discussion of this topic may be found on pages 19427 and 19428 of the preamble to the final HON rule (59 FR 19402) promulgated on April 22, 1994.

As in the HON rule, for the proposed rule, emissions averaging is not allowed as a compliance option for new sources. The decision to limit emissions averaging to only existing sources was based on the fact that new sources have historically been held to a stricter standard than existing sources. It is most cost effective to integrate state-of-the-art controls into equipment design and to install the technology during construction of new sources. By allowing emissions averaging, existing sources have the flexibility to achieve compliance at diverse points with varying degrees of control already in place in the most economically and technically reasonable fashion. This concern does not apply to new sources which can be designed and constructed with compliance in mind. Therefore, emissions averaging is only allowed at existing sources. Further discussion of this topic may be found on pages 19426 and 19427 of the preamble to the final HON rule (59 FR 19402) promulgated on April 22, 1994.

While the EPA believes that there is limited potential for emissions averaging in this rule, the EPA did not want to exclude emissions averaging based on the available data and welcomes comments on whether or not to include emissions averaging for the Group I polymers.

As stated previously, the emissions averaging provisions of this rule are essentially identical to the provisions contained in the HON. This rule has incorporated emissions averaging concerns expressed during the HON public comment period which were discussed later in a supplementary federal register notice published on October 15, 1993; 58 FR 53479. These 5 concerns were: (1) state discretion on emissions averaging, (2) inclusion of risk in averaging determinations, (3) compliance period for emissions averaging, (4) limit on number of emission points allowed in an average, and (5) effect of missing monitoring data/parameter exceedances on averaging. The EPA requests comment on these topics.

Commenters supporting emissions averaging are urged to submit specific information on how emissions averaging would benefit their facility. The EPA will consider all comments. However, commenters should be aware that the EPA has in the past excluded averaging emissions associated with process vents from batch unit operations and equipment leaks.

Emissions from batch process vents have been excluded because there is no acceptable satisfactory methodology available to quantify the emission reduction that would be gained or lost in an emissions averaging scheme. While there are methods presented in the proposed rule for determining emissions from batch process vents, the EPA does not find them adequate for the purposes of emissions averaging. The EPA has judged that the accuracy and consistency needs of emission estimates for emissions averaging are greater than the accuracy and consistency needs for determining applicability of the batch process vent provisions.

Equipment leaks also have not been included in an emissions averaging scheme because: (1) the proposed standard for equipment leaks has no fixed performance level; and (2) no method currently exists for determining the magnitude of allowable emissions to assign for leaks. Without an acceptable method to determine the magnitude of allowable emissions to assign for batch process vents and equipment leaks, an averaging approach that includes these two emission source types has been considered technically infeasible.

The emissions averaging provisions included in the proposed rule are tailored after those in the HON; and are essentially identical in concept, provisions, and constraints. The number of points allowed to be included in the emissions average appears to be identical to the HON, but there is actually a slight difference. Both the proposed elastomer rule and the HON allow no more than 20 points in an emissions average; this is increased to 25 points where pollution prevention measures are used to control emission points to be included in an average. However, the emission point limit in the HON is on an individual affected source basis, while the limit in the proposed rule applies to all affected sources at a plant site. For plant sites where only one elastomer subcategory is present, the result is the same. However, at plant sites where more than one elastomer subcategory exists, 20 emission points represent the maximum number that may included in the emission averages for all of the elastomer affected sources.

For example, assume a butyl rubber process and an ethylene propylene rubber process are located at the same plant site, and each have emission points to be included in an emissions average. First, emission credits from the butyl rubber emission points could not be used to offset emission debits from the ethylene propylene rubber process, and vice versa. Second, the maximum number of emission points that could be included in both emission averages would be 20 (assuming no pollution prevention). The owner/operator could divide the number of emission points between the facilities in any combination, as long as the total number for both processes was less than 20.

Reasons for constraining the number of points to be included in emissions averaging are described on pages 19428 - 19429 of the preamble to the final HON rule (59 FR 19402) promulgated on April 22, 1994. In summary, there is a concern about the burden and cost to implementing agencies of overseeing and enforcing large numbers of emission points in averages.

In selecting the number of points to allow in an emissions average for the proposed rule, differences in the effect of the breadth of the definition of affected source of the HON compared to this rule needed to be considered. This is important because all emissions averaging is on an affected source basis (for today's proposed rule, an affected source basis is the same as a subcategory basis). The definition of the affected source in the HON includes the production of any chemical included on the HON list. Typically, chemical production plants covered by the HON produce multiple chemicals in multiple process units at one plant site. The 20- to 25-point limit would apply to the combination of all these process units at one site. The definition of the affected source for the proposed rule is more limited. The proposed rule has 12 subcategories. The emissions averaging provisions apply to each subcategory separately; any emissions averaging has to occur among emission points from a single subcategory at the plant site. Some plant sites contain multiple subcategories; the maximum number of such collocated subcategories (that do not share equipment) at any one plant site is 3. Thus, if the HON emission point limit were applied to this rule on an affected-source basis, this plant site would be allowed to include 20 to 25 emission points per subcategory; combined, this would potentially equal a total of 60 to 75 emission points across three Emissions Averaging Plans. The EPA believes that the burden and cost to implementing agencies for the inclusion of such large numbers of emission points in averages would be unreasonable. Under a similar scenario under the HON, the same plant site could include only 20 to 25 emission points. The EPA decided that the number of emission points allowed in the emissions averaging provisions of the proposed rule needed to be made more in parity with the HON, resulting in the plant-site basis.

In addition, the EPA believes that most sources will not find a large number of opportunities to generate cost-effective credits. In fact, since the process back-end is considered a single emission point for the purpose of emissions averaging, most facilities reported fewer than 10 total emission points. Therefore, it is anticipated that imposing a limit should not affect most sources.

The EPA is specifically requesting comments on the application of the 20 emission point limit (25, if pollution prevention is used) on all elastomer affected sources located at a single plant site, for purposes of averaging in this proposed rule. The EPA is especially interested in specific sitatuations where this limit will preclude known opportunities within real facilities to generate cost-effective credits. For these cases, the comments would be more useful if they address specifics on the emission and cost quantities computed, with detailed calculations and references.

Finally, the proposed rule grants State and local implementing agencies the discretion to preclude sources from using emissions averaging. The primary reasons for the EPA allowing this descretion are as follows. First, averaging increases the complexity of the rule and thus, increases the administrative burden on State and local agencies. Second, averaging may conflict with some existing State programs for regulating HAPs. Third, because emissions averaging is an alternative compliance method to the primary control strategy, the EPA believes that States should have the discretion to exclude it as opposed to other provisions that are essential to the rule for which no alternative compliance mechanism has been provided. Since this provision of the today's regulation is identical to the HON, further discussion of this EPA decision may be found in the promulgated HON preamble.

8.3 RATIONALE FOR THE SELECTION OF EMISSION POINTS TO BE COVERED BY THE PROPOSED STANDARDS

Emissions from the production of Group I polymers and resins were identified as occurring from storage vessels, front-end process vents, back-end process operations, equipment leaks, and wastewater operations. The proposed elastomers regulation includes standards for all of these emission source types.

8.4 RATIONALE FOR THE SELECTION OF THE LEVELS OF THE PROPOSED STANDARDS

The approach for evaluating the MACT floors and determining regulatory alternatives is discussed in Chapter 6. This section presents the rationale for the selection of the level of the proposed standards for new and existing sources.

8.4.1 Selection of the Levels of the Proposed Standards for Existing Sources

The discussion of the rationale for the selection of the levels of the proposed standards for existing sources in this section is separated into two subcategory groups. The first group consists of those source categories for which only one regulatory alternative was developed and analyzed. This group contains all source categories except butyl rubber (BR) and halogenated butyl rubber (HBR). The second group consists of BR and HBR.

For the subcategories epichlorohydrin (EPI), ethylene propylene rubber (EPR), Hypalon (HYP), neoprene (NEO), nitrile butadiene latex (NBL), nitrile butadiene rubber (NBR), polysulfide rubber (PSR), polybutadiene rubber and/or styrene butadiene rubber by solution (PBR/SBRS), styrene butadiene latex (SBL), and styrene butadiene rubber by emulsion (SBRE), only one regulatory alternative was developed. For each subcategory, the regulatory alternative represents a level of control at least as stringent as the MACT floor. For four of these subcategories, HYP, PSR, SBL, and SBRE, the regulatory alternative represents the MACT floor for each emission source type. For the remaining six subcategories, the regulatory alternative represents a level of control more stringent than the MACT floor for at least one emission source type. Table 8-6 shows the cost-effectiveness values for all options more stringent than the MACT floor, as well as the overall cost effectiveness for the regulatory alternative for each subcategory.

Considering these cost impacts, as well as non-air environmental and energy impacts, the EPA judged that the level of control for the single regulatory alternative was reasonable. Therefore, the EPA selected the regulatory alternative as the level of the proposed standards for the EPI, EPR, HYP, NEO, NBL, NBR, PSR, PBR/SBRS, SBL, and SBRE subcategories.

For BR and HBR, the first regulatory alternative represents a level of control more stringent than the MACT floor. The cost effectiveness of the individual emission source types above the MACT floors is also shown in Table 8-6. As shown in the table, the highest cost-effectiveness for an individual emission source type for the BR or HBR subcategory is $3,100 per megagram for BR front-end process vents. The overall regulatory alternative cost-effectiveness values for the first regulatory alternative are $2,200 per megagram for BR and $1,000 per megagram for HBR. The incremental cost-effectiveness values for going from the first to the second regulatory alternative are $6,000 per

TABLE 8-6. COST EFFECTIVENESS VALUES OF REGULATORY OPTIONS MORE STRINGENT THAN THE FLOOR

Subcategory	Cost Effectiveness of Options More Stringent than the MACT Floor ($/Mg)					
	Storage	Front-End Process Vents	Back-End Process	Wastewater	Equipment Leaks	Overall[a]
Butyl	FLOOR	$3,100	FLOOR	$1,600	$1,700	$2,200
Epichlorohydrin	FLOOR	FLOOR	FLOOR	FLOOR	$2,000	$1,900
Ethylene Propylene	$2,200	$2,800	FLOOR	FLOOR	$2,000	$1,800
Halobutyl	$300	$1,400	FLOOR	FLOOR	$1,100	$1,000
Hypalon®	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR
Neoprene	FLOOR	$2,900	FLOOR	FLOOR	$1,600	$2,500
Nitrile Butadiene Latex	FLOOR	FLOOR	FLOOR	FLOOR	$2,600	$1,800
Nitrile Butadiene Rubber	$1,700	FLOOR	FLOOR	FLOOR	$1,200	$1,200
Polybutadiene/ Styrene Butadiene Rubber by Solution	FLOOR	FLOOR	FLOOR	FLOOR	$2,600	$5,500
Polysulfide	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR
Styrene Butadiene Latex	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR
Styrene Butadiene Rubber by Emulsion	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR

[a] The overall cost effectiveness reflects the cost of the entire alternative including those options that are equivalent to the MACT floor.

megagram for BR and $16,200 for HBR. The EPA does not consider the impacts of going to the second regulatory alternative reasonable. Therefore, for BR and HBR, the EPA selected the first regulatory alternative as the level for the proposed standard.

8.4.2 Selection of the Levels of the Proposed Standards for New Sources

The 1990 Amendments require that standards be set for new sources that are no less stringent than the level represented by the best controlled similar source, which is referred to as the new source MACT floor. The EPA constructed the single new source regulatory alternative for all subcategories by including in it the best level of control identified for each emission source type within the subcategory using the procedure described in Chapter 6. No more stringent regulatory alternatives were identified for any of the subcategories. Further, as discussed in Chapter 7, no impacts were assessed for the new source alternatives, since no new sources are projected. Therefore, the EPA considers the regulatory alternative appropriate for new sources, and has selected it as the level of the proposed standard.

8.5 RATIONALE FOR THE SELECTION OF THE FORMATS OF THE PROPOSED STANDARDS

As discussed in the introduction to this chapter, the decision to use the HON in the determination of MACT floors and regulatory alternatives predetermined that the format of the proposed rule would resemble the HON. Therefore, the proposed standards would adopt the formats found in the HON for storage vessels, continuous front-end process vents, wastewater, and equipment leaks. The format of the applicability provisions of the batch front-end process provisions would be adopted from the Batch Processes ACT, and the formats of the testing, reporting, recordkeeping, and compliance provisions for batch front-end process vents are based on the HON. The Federal Register notice for the HON (57 FR 62608, December 31, 1992) provides the rationale for the selection of the specific formats used in the final rule for the HON. The Batch Processes ACT document discusses the rationale for the selection of the recommended formats for batch process vents.

In addition to adopting various portions of existing standards and guidance, the proposed rule also contains standards for controlling emissions from back-end process operations. The format of the proposed back-end process standards are limits on the amount of residual HAP in the raw polymer product being fed to the back-end operation, in units of weight of HAP per weight of dry crumb or latex. There is also a section of the back-end process operations requirements that only applies to carbon disulfide emissions from SBRE facilities. The format of this section is a limit on the carbon disulfide concentration in SBRE dryer vents.

The following sections provide, on an emission source type basis, more detailed discussions of the rationale for the selection of the formats of the proposed standards. Particular attention will be provided to instances where the proposed formats are different from the HON.

8.5.1 Storage Vessels

For storage vessels, the format of the proposed standards is adopted from the HON. The format of the standard is dependent on the method selected to comply with the standards. If tank improvements (e.g., internal or external floating roofs with proper seals and fittings) are selected, the format is a combination of design, equipment, work practice, and operational standards. If a closed vent system and control device are selected, the format is a combination of design and equipment standards.

One elastomer-specific requirement of the storage vessel provisions is that latex storage vessels located downstream of the stripping operations, are exempt from all storage vessel requirements. The reason for this exemption is that data provided by industry indicates that in no case would a stripped latex storage vessel be a Group 1 vessel, given the residual HAP monomer levels in latex after stripping and the vapor pressure of the HAP monomers. The EPA decided that requiring the owner or operator to make a Group 1/Group 2 determination for each stripped latex storage vessel, when the opportunity does not realistically exist for the vessel to be Group 1, was inappropriate. The EPA also is interested in information related to the residual HAP content (and vapor pressure) in latexes prior to the stripper (these vessels would most likely fall under the definition of surge control vessel and not storage vessel). If data are submitted that indicate unstripped latexes, or other liquid elastomer products or intermediates, have no realistic opportunity to exceed the applicability thresholds for storage vessels, surge control vessels, or bottoms receivers, the EPA will consider similar exemptions for equipment containing these materials.

8.5.2 Continuous Front-End Process Vents

For continuous front-end process vents, the format of the proposed standards is adopted from the HON. As with storage vessels, the format is also dependent on the method selected to comply with the standards. If a flare is selected, the format is a combination of equipment and operating specifications. If a control device other than a flare is used, the formats are a percent reduction and an outlet concentration.

As discussed in section 8.1.5.2, the proposed regulation exempts halogenated vent streams at butyl rubber and halobutyl facilities from the requirement to control hydrogen halides and halogens from the outlet of a combustion device, if the stream was vented to a flare or boiler prior to the proposal date. The rationales for the development and selection of these exemptions are provided in sections 6.5 and 8.4 of this document, respectively.

8.5.3 Batch Front-End Process Vents

As noted above, the format of the applicability criteria of the proposed batch front-end process vent provisions is adopted from the Batch Processes ACT. The format of the batch front-end process vent control provisions is dependent on the method selected to comply with the standards. If a flare is selected the format is a combination of equipment and operating specifications. If a control or recovery device other than a flare is used, the format is a percent reduction.

As discussed in Chapter 6, the applicability criteria for the Batch ACT 90-percent control level was selected because the cost-effectiveness determined in the analysis of the Batch ACT was comparable to the cost-effectiveness of the continuous process vent provisions in the HON, which the EPA determined considered to be reasonable for the control of HAP from process vents.

One difference in the format of the proposed batch front-end process vent provisions, and the format recommended in the Batch ACT, is related to the combination of batch process vents for applicability determinations. The Batch Processes ACT contains a procedure for the aggregation of batch process vents for applicability determinations. The EPA did not include this aggregation procedure in the proposed batch front-end process provisions. The Batch ACT aggregation procedure assumes a process unit with many small batch unit operations and associated process vents, and elastomer production facilities do not fit this prototype. Therefore, the proposed batch front-end process provisions determine applicability on an individual vent basis.

For Group 2 batch front-end process vents, the format of the proposed standards is a batch cycle limitation, which is an enforceable limit on the number of batches that can be processed in a particular unit operation in a year. The proposed batch cycle limitation ensures that affected sources and enforcement agencies are cognizant of the number of batch cycles that will cause a Group 2 batch front-end process vent to become a Group 1 batch front-end process vent. The recordkeeping and reporting requirements associated with the batch cycle limitation provide a simple means for owners and operators to demonstrate compliance, without the annual re-calculation of emissions and re-determination of the group status of each batch front-end process vent.

If a Group 1 halogenated batch front-end process vent is controlled using a combustion device, the proposed standards require that hydrogen halide emissions at the outlet of the combustion device be reduced by 99 percent. The purpose of this requirement is to reduce the emissions of hydrogen chloride, hydrogen bromide, or any other HAP formed during the combustion of halogenated organics. A halogenated batch front-end process vent is defined as a vent that has an annual mass emission rate of halogen atoms in organic compounds of 3,750 kilograms per year or greater. The EPA derived this number by converting the level of emissions defining a continuous process vent stream as halogenated in the HON (0.45 kilograms per hour) to an annual basis.

As discussed in section 8.1.5.2, HAP emissions from a Group 1 batch front-end process vent must be controlled using a flare, or by reducing HAP emissions by 90-percent <u>over the batch cycle</u>. During a production cycle in a batch unit operation, there are often emission episodes resulting from several different steps of the batch process. The vent streams from each of these emission episodes can differ significantly in flow rate, HAP concentration, and other characteristics important in the ability to apply controls. The 90-percent control requirement is on a batch cycle basis, rather than a continuous basis, to allow owners and operators the flexibility to control emission episodes to varying levels, as long as the 90-percent reduction for all emission episodes in the cycle is accomplished.

The reporting, recordkeeping, and monitoring requirements of the proposed batch front-end process vent provisions were modeled after the HON continuous process vent provisions. This was to maintain consistency in the formats of the process vent provisions.

The data submitted by industry indicated that often batch front-end process vent streams were combined with continuous process vent streams, or were combined with other batch front-end process vent streams, prior to a recovery or control device at elastomer production facilities. The EPA has included conditions in the proposed rule related to these two situations to simplify compliance by reducing the complexity of the applicability determination, and the reporting, recordkeeping, and monitoring requirements for batch front-end process vents.

8.5.4 Process Back-End Operations

For back-end process emissions, the format of the proposed standards is a limit on the amount of residual HAP in the raw polymer product being fed to the back-end operation, in units of weight of HAP per dry crumb or latex. This format is generally based on the format of permit conditions. The rationale for the selection of the format of the process back-end operation provisions is discussed below in sections 8.5.4.1 through 8.5.4.3.

There is also a section of the back-end process operations requirements that only applies to carbon disulfide emissions from SBRE facilities. The format of this section is a limit on the carbon disulfide concentration in SBRE dryer vents. The rationale for the selection of this format is discussed in section 8.5.4.4.

8.5.4.1 Selection of subcategories for residual HAP limitations

There are only three subcategories (EPR, PBR/SBRS, and SBRE) that have proposed residual HAP limitations in the proposed rule. As discussed in Chapter 6, these three subcategories were selected because in each subcategory, some HAP emission control was demonstrated and required by a permit condition. The stripping of residual HAP from the crumb or latex occurs in all 12 subcategories. However, these three represent the subcategories where State permitting agencies have recognized the potential for emission reduction and established conditions. In other words, for these subcategories, action is taken to not only reduce the residual HAP content for process economics and product quality reasons, but also for emission reduction purposes.

In addition, not only is control demonstrated for these three subcategories, but they make up the majority of process back-end emissions. As discussed in Chapter 5, the back-end emissions from these three subcategories make up almost

90 percent of the total reported back-end emissions for all 12 subcategories.

8.5.4.2 Residual HAP limitation units

For the solution process subcategories (EPR and PBR/SBRS), the units are kilogram residual HAP per Megagram crumb rubber dry weight. First, this format generally matches permit limits for EPR and PBR/SBRS facilities. Also, as discussed in Chapter 6, the MACT floors were determined based on submitted annual emission and production information, which were directly converted to kg HAP/Mg production. The weight of the product in the limitation does not include the weight of oil extenders or other additives, or the weight of water that may be contained in the crumb leaving the strippers. The rationale for this selection of units is to base the residual HAP content limitation on factors that most influence the ability to remove the residual HAP from the polymer. Oil extenders and other additives increase the weight of the polymer, but do not add any additional HAP, and do not significantly affect the ability to strip residual HAP from the polymer. Since the amount of oil extenders added for a particular grade may not be uniform for all producers, the inclusion of the weight of these and other additives in the denominator of the residual HAP limitation would in affect, change the stringency of the standards among facilities. Similarly, the weight of the water in the crumb is dependent on many factors that are not important in the amount of residual HAP that can removed.

For SBRE, the EPA also considered units of kilogram HAP per megagram crumb rubber dry weight. However, three of the four SBRE facilities reported permit conditions with units of weight of HAP per weight of latex (including the weight of the water). In order to maintain consistency with the existing requirements, the EPA selected the units of kg HAP/Mg latex for SBRE.

An important distinction in the residual HAP limitation units is that they are based on the weight of dry crumb or latex leaving the stripping operation. This was selected because (1) the residual HAP content is required to be determined at the exit of the stripping operation, and (2) there is often not a direct correspondence between the polymer produced, stripped, and finished.

8.5.4.3 Compliance options

As discussed in the summary of the proposed back-end provisions in section 8.1.5.3, there are two methods of compliance: (1) stripping and (2) add-on control. If complying by stripping, there are two options for demonstrating compliance: (1) sampling and (2) continuously monitoring stripper operating parameters. If complying using add-on control, compliance is demonstrated by an initial source test and the continuous monitoring of control device parameters.

The sampling compliance option requires that one sample be taken of each grade or batch each day. More frequent sampling was considered, but the EPA did not believe that it was warranted, given the consistency needed in the process to ensure uniformity in the product, and the burden of increased sampling and testing. The EPA also considered only requiring one sample for each grade, even if the same grade was processed for several days. However, this option was rejected because first, the EPA was uncomfortable relying on process consistency for periods exceeding 24 hours; and second, the reduction in the number of samples required would mean that a single "missed" sample could be the determinant in a complete week's compliance determination. (Failure to sample and analyze 75 percent of the required samples in a week is a violation of the standard - see section 8.7).

The stripper parameter monitoring compliance option allows residual HAP contents determined initially to be used instead of sampling each grade or batch, as long as the stripper parameters are within established levels during the production of the grade or batch. The regulation requires continuous monitoring of stripper parameters.

Unlike the sampling option, the stripper parameter monitoring option is strictly based on a grade or batch. The EPA concluded that the continuous monitoring of stripper operation provided an adequate demonstration of process continuity, and thus residual HAP content.

If during the monitoring of stripper parameters, one hourly average parameter value is not in accordance with the established level for that parameter, the owner or operator is not allowed to use the initially-established residual HAP content, but is required to obtain a sample of the crumb or latex and determine the residual HAP content. The EPA considered requiring sampling if a single 15-minute parameter reading was not in accordance with the established level, but determined that this was too stringent.

The format for compliance using add-on control was modeled after the continuous front-end process vent format, with initial compliance determined by a source test. Control device operating parameter levels are established during the source test, and continuous compliance is based on parameter monitoring.

One important point is the significance of the amount of emissions captured and routed to the control device in a process back-end operation. This is an important concept related to the re-testing provisions of the proposed standards. Any process change that could result in either (1) an increase in the amount of HAP entering the back-end of the process (i.e, increase in maximum HAP content of crumb), or (2) a decrease in the capture efficiency, could affect the ability of the control device to control emissions to a level that is equivalent to the proposed HAP emission limitation. Therefore, the EPA concluded that re-testing is necessary for a wider range of process changes than would require re-testing for front-end process vents.

In order to demonstrate initial compliance, the calculated adjusted residual HAP content for all three test runs must be less than the level in the standard. While the averaging of the three test runs is characteristic of other EPA testing procedures, the EPA believed in this case it was necessary to require that all test runs be in compliance with the applicable HAP emission limitation.

8.5.4.4 Carbon disulfide limitations for styrene butadiene rubber by emulsion producers

The format of the carbon disulfide limitations in the proposed rule, which is a concentration limit in SBRE dryer vents, was selected based on the data provided to the EPA. The primary form of data was in the form of carbon disulfide concentrations. Other formats were considered, such as a maximum carbon disulfide emission per unit of production, a restriction on the use of sulfur-containing shortstopping agent, and a percent reduction in carbon disulfide emissions. In each case, the EPA was not provided sufficient data to establish a standard. It should be noted that the EPA is specifically requesting comments on the format of this section of the proposed regulation.

8.5.5 Wastewater Operations

The format of the wastewater standards is adopted from the HON. For wastewater streams requiring control, the proposed standards incorporate several formats: equipment, operational, work practice, and emission standards. The particular format selected depends on which portion of the wastewater stream is involved. For transport and handling equipment, the selected format is a combination of equipment standards and work practices. For the reduction of HAP from the wastewater stream itself, several alternative formats are included, including five alternative numerical emission limit formats [overall percent reduction for total volatile organic HAP (VOHAP), individual HAP percent reduction, effluent concentration limit for total VOHAP, individual VOHAP effluent concentration limits, and mass removal for HAP] and equipment design and operation standard for a steam stripper. For vapor recovery and destruction devices other than flares, the format is a weight percent reduction. For flares, the format is a combination of equipment and operating specifications.

As noted in section 8.1.5.4, back-end wastewater streams at EPR, PBR/SBRS, and SBRE facilities are exempt from the wastewater requirements. The EPA concluded that, because facilities in these subcategories were subject to residual HAP limitations in the raw product entering the back-end of the process, additional control of residual HAP in back-end wastewater was not warranted.

8.5.6 Equipment Leaks

For equipment leaks, the proposed standards incorporate several formats, all adopted directly from the HON: equipment, design, base performance levels (e.g., maximum allowable percent leaking valves), work practices, and operational practices. Different formats are necessary for different types of equipment, because of the nature of the equipment, available control techniques, and applicability of the measurement method. In addition, a work practice standard is adopted for equipment leaks resulting in the emission of HAP from cooling towers at all facilities producing a listed elastomer. This standard requires a leak detection and repair program to detect and repair leaks of HAP into cooling tower water.

As noted above in section 8.5.1, latex storage vessels, surge control vessels, and bottoms receivers located downstream of the stripper are exempt from the proposed storage vessel and equipment leak provisions for the rule. The rationale for this exemption is provided in section 8.5.1.

8.6 SELECTION OF COMPLIANCE AND PERFORMANCE TEST PROVISIONS AND MONITORING REQUIREMENTS

For the most part, the control devices and level of control required by the proposed rule are the same as those in subpart F, G or H. Further, the control devices likely to be used in complying with the proposed requirements for batch front-end process vents were already considered as part of subpart G. As a result, the EPA has determined that there is no need to change performance testing provisions or the parameters selected for monitoring. Since the rationale for the selected provisions has been presented in detail in the preambles to the proposed subpart and promulgated subparts F, G, and H, they are not repeated here in the same depth. The paragraphs below briefly discuss the rationale for the selected provisions for each emission source type. Later in this section, the rationales for the use of parameter monitoring and the overall compliance certification provisions are presented.

8.6.1 Storage Vessels

The proposed storage vessel provisions require control by tank improvements or a closed vent system and control device; however, the choice of control technologies is limited depending on the material stored. For vessels storing liquids with vapor pressures less than 76.6 kPa, either control option may be selected. However, for vessels storing liquids with vapor pressures greater than or equal to 76.6 kPa, tank improvements do not achieve the expected level of emission reductions. As a result, Group 1 storage vessels containing liquids with a maximum true vapor pressure of organic HAP greater than or equal to 76.6 kPa must be controlled with a closed vent system and control device.

8.6.2 Continuous Front-End Process Vents

The proposed rule specifies the group determination procedures, performance tests, monitoring requirements, and test methods necessary to determine whether a process vent from a continuous front-end unit operation is required to be controlled and to demonstrate that the allowed emission levels are achieved when controls are applied. The following paragraphs discuss each of these.

8.6.2.1 Group determination procedures

Except as discussed in the next paragraph, the proposed rule requires each owner or operator to determine for each continuous front-end process vent whether the vent is a Group 1 or Group 2 process vent. There are three group determination procedures: (1) process vent flow rate measurement, (2) process vent HAP concentration measurement, and (3) TRE index value determination. A detailed discussion of the rationale for these three procedures is found on pages 62636-62637 of Federal Register Vol. 57, No. 252, December 31, 1992.

Alternatively, an owner or operator may chose to comply directly with the requirement to reduce organic HAP emissions by

98 weight-percent or to an outlet concentration of 20 ppmv through use of a control device.

8.6.2.2 Performance test

Initial performance tests are required for all control devices other than flares and certain boilers and process heaters. Specifically, testing would be required for: (1) incinerators, (2) scrubbers used with combustion devices to control halogenated vent streams, and (3) some boilers and process heaters smaller than 44 MW (150 million Btu/hr). Performance tests are being required because they (1) ensure that a control device achieves the required control level and (2) serve as the basis for establishing operating parameter levels required for monitoring.

Because their percent reduction and outlet concentration cannot feasibly be measured, flares are not required to meet the requirements in Section 63.11 for operating conditions.

8.6.2.3 Test methods

The proposed process vent provisions would require the use of approved test methods to ensure consistent and verifiable results for group determination procedures, initial performance tests, and compliance demonstrations.

8.6.2.4 Monitoring

Control devices used to comply with the proposed rule need to be maintained and operated properly if the required level of control is to be achieved on a continuing basis. Monitoring of the control device operating parameters can be used to ensure that such proper operation and maintenance are occurring.

The proposed standard lists the parameters that can be monitored for the common types of combustion devices: firebox temperature for thermal incinerators; temperature upstream and downstream of the catalyst bed for catalytic incinerators; firebox temperature for boilers and process heaters; and presence of a flame at the pilot light for flares. These parameters were selected because they are good indicators of combustion device performance, and instruments are readily available at a reasonable cost to continuously monitor these parameters. The proposed rule also allows the owner or operator to request to monitor other parameters on a site-specific basis. The proposed rule also specifies monitoring requirements for scrubbers installed to remove halogens and hydrogen halides from the combustor outlet.

The proposed standard would require the owner or operator to establish site-specific parameter levels through the Notification of Compliance Status report and operating permit. Site-specific parameter levels accommodate site-specific differences in control design and process vent stream characteristics.

For Group 2 continuous front-end process vents that have TRE index values greater than 1.0 but less than or equal to 4.0, monitoring of the final recovery device would be required to ensure that it continues to be operated as it was during the group determination test when the initial TRE index value was calculated. Improper recovery device operation and maintenance could lead to increased organic HAP concentration, potentially reducing the TRE index value below 1.0, and causing the vent to become a Group 1 process vent. Continuous monitoring will ensure continued good performance of recovery devices. The TRE index value monitoring level of 4.0 is being proposed because the variability of the process parameters established during normal operating conditions are unlikely to vary to the extent that a TRE value above 4.0 would be reduced to a TRE level less than 1.0 and thus require control.

The proposed rule specifies the parameters that can be monitored for the three common types of recovery devices: exit temperature of the absorbing liquid and exit specific gravity for absorbers; exit temperature for condensers; and 1) total regeneration stream mass flow during carbon bed regeneration cycle and 2) temperature of the carbon bed after regeneration for carbon adsorbers. These parameters were selected because they are good indicators of recovery device performance, and instruments are readily available at a reasonable cost to continuously monitor these process parameters. The proposed rule also allows the owner or operator to request to monitor parameters on a site-specific basis. The owner or operator would establish a site-specific level for the parameters through the Notification of Compliance Status report and operating permit.

8.6.3 Batch front-end process vents

As for continuous front-end process vents, some batch front-end process vents are more cost effective to control than others. Therefore, cost effectiveness is related to the procedures that are being proposed for the group determination for batch front-end process vents. These procedures are taken from the Batch Processes Alternative Control Technologies (ACT) document. The Batch Processes ACT describes applicability criteria (i.e., annual emissions and annual average flowrate) for distinguishing between batch front-end process vents that are cost effective to control and those that are not. The rationale for these applicability criteria and procedures is presented in depth in the Batch Processes ACT document.

The proposed rule allows the determination of annual HAP emissions using a series of equations that are from the Batch ACT and included in the rule. As an option to using these equation, owners and operators can use testing to determine emissions. The proposed rule requires that testing be conducted to determine flow rates for each batch emission episode, which are then used to calculate an annual average flow rate.

For the same reasons the proposed rule requires a performance test and continuous monitoring of a control device for a continuous front-end process vent, performance tests and continuous monitoring are required for the control or recovery devices used by a source to comply with the batch front-end process vents control requirement. Also, the monitoring parameters selected for recovery devices were presented and discussed as part of the continuous front-end process vent provisions and in the preamble to the proposed subpart G. As discussed in section 8.5.3, compliance for batch front-end process vents is on a batch-cycle basis, rather than on a continuous basis.

Because the batch front-end process vent applicability is determined on an annual basis, the EPA established the batch cycle limitation for Group 2 batch front-end process vents in an attempt to minimize the number of Group 2 batch front-end process vents that would become non-compliant. The purpose of the batch cycle limitation, and quarterly reporting of the number of batch cycles accomplished, is to ensure that a Group 2 batch front-end process vent does not become a Group 1 batch front-end process vent simply due to accomplishing more batch cycles in a year than were anticipated at the time the initial group determination was made. As mentioned earlier, a source may set the batch cycle limitation at any level it desires as long as the batch front-end process vent remains a Group 2 batch front-end process vent. Since this may prove too "restrictive" for an owner or operator, the proposed rule allows an owner or operator to declare any batch front-end process vent Group 1 and control as required by the proposed rule.

8.6.4 Process Back-End Operations

The proposed rule specifies the performance tests, test methods, and monitoring requirements necessary to determine that the allowed back-end emission limitations are achieved. The following paragraphs discuss each of these.

8.6.4.1 Performance tests and test methods for residual HAP limitations

Initial performance tests, in the traditional sense, are required for facilities complying with the back-end operations provisions using add-on control. Testing is required for all control and recovery devices, other than flares and certain boilers and process heaters. The proposed back-end process provisions would require the use of approved test methods.

Initial tests are required for facilities complying by using stripper parameter monitoring. The purpose of this initial testing is to establish correlations between residual HAP contents and stripper operating parameters. The EPA is proposing test methods to determine the residual HAP content in crumb and latex.

If an owner or operator complies with the proposed back-end standards by sampling, periodic sampling and testing is required, as discussed in sections 8.1.5.3 and 8.5.4.3. The residual HAP test methods being proposed by the EPA would also be used for these analyses.

8.6.4.2 Performance tests and test methods for carbon disulfide emission limitations for SBRE facilities

Initial performance tests are required to "verify" each standard operating procedure as an acceptable procedure that results in carbon disulfide concentrations of 10 ppmv or less in the dryer stacks at SBRE facilities. One performance test is required for each standard operating procedure. Method 18 is specified to measure the carbon disulfide concentration. Additional performance tests are not required unless a new standard operating procedure is added, or an existing standard operating procedure is revised.

8.6.4.2 Monitoring requirements

Control and recovery devices and strippers used to comply with the proposed rule need to be maintained and operated properly if the required level of control is to be achieved on a continuing basis. Monitoring of control and recovery device and stripper parameters can be used to ensure that such proper operation and maintenance are occurring.

For control and recovery devices, the proposed back-end process operation standard uses the same list of parameters discussed above for continuous front-end process vents. For strippers, the proposed regulation requires the monitoring of temperature, pressure, steaming rates, and a parameter indicative of residence time. These parameters were based on recommendations from industry. However, the EPA is interested in comments on the appropriateness of these parameters. In addition, the EPA is specifically requesting comments on the use of predictive computer modeling in addition to, or in place of, stripper parameter monitoring.

8.6.5 Wastewater Operations

Two important parameters must be quantified initially and whenever process changes are made to determine whether a process wastewater stream is a Group 1 or Group 2 stream. These parameters are the annual wastewater quantity for a stream and the VOHAP concentration of HAP in the stream. The VOHAP concentration can be quantified as a flow-weighted annual average for total VOHAP or for individually-speciated HAP. Several methods are allowed by the proposed rule for determining both of these parameters.

Initial performance tests for control of Group 1 wastewater streams are not required by the proposed rule. For treatment processes and control devices, facilities have the choice of using either performance tests or engineering calculations to demonstrate the compliance of those units with the standards. Engineering calculations, supported by the appropriate documentation, have been allowed to provide a less costly alternative to that of actual testing.

A performance test is not specified for the design steam stripper. Installation of the specified equipment, along with monitoring to show attainment of the specified operating parameter levels, demonstrates compliance with the equipment design and operation provisions. Thus, a performance test is not necessary.

The proposed process wastewater provisions include requirements for periodic monitoring and inspections to ensure proper operation and maintenance of the control system and continued compliance.

8.6.6 Equipment Leaks

The proposed rule retains the use of Method 21 to detect leaks of organic compounds from equipment; however, several modifications were made to the existing procedures. These modifications consist of changes to the calibration gases required, addition of procedures for response factor correction, and addition of procedures for pressure testing of batch processes. The bases for the changes to the provisions are presented in the preamble to the proposed subpart H.

In addition, periodic monitoring for leaks is required to demonstrate compliance for heat exchange systems. The frequency of periodic monitoring becomes less frequent as data show that leaks are not present. This monitoring system is proposed to minimize the burden on the source.

8.7 SELECTION OF PARAMETER MONITORING AND COMPLIANCE CERTIFICATION PROVISIONS

The proposed rule requires monitoring of control and recovery device operating parameters and reporting of periods when parameter values are above maximum or below minimum established levels. Under the NSPS and NESHAP programs, parameter monitoring has traditionally been used as a tool in determining whether control devices are being maintained and operated properly. However, Section 114(a)(3) of the Act and Section 70.6(c) of the operating permit rule (57 FR 32251) require the submission of "compliance certifications" from sources subject to the operating permit program. Section 114(a)(3) of the amended CAA requires enhanced monitoring and compliance certifications of all major stationary sources. The annual compliance certifications certify whether compliance has been continuous or intermittent. Enhanced monitoring shall be capable of detecting deviations from each applicable emission limitation or standard with sufficient representativeness, accuracy, precision, reliability, frequency, and timeliness to determine if compliance is continuous during a reporting period. The monitoring in this regulation satisfies the requirements of enhanced monitoring.

In light of these requirements, the EPA has considered how sources subject to this rule would demonstrate compliance. The EPA has concluded that operating parameter monitoring can be used for this purpose.

For the proposed rule, the EPA is requiring sources to establish site-specific parameter levels. Although in previous NSPS and NESHAP, the EPA has specified a pre-determined range of operating parameter values, such values could be considered inadequate given the increased importance of parameter monitoring in determining and certifying compliance due to the new requirements in Section 114 of the Act. Allowing site-specific levels for monitored parameters accommodates site-specific variation in emission point characteristics and control device designs. The proposed procedure for establishing operating parameter levels for continuous and batch front-end process vents, and back-end process operations complying using add-on control, is based on performance tests. For back-end process operations complying by stripping and stripper parameter monitoring, the proposed procedure for establishing operating parameter levels is based on residual HAP content testing.

For continuous and batch front-end process vent, and back-end process operations complying using add-on control, the proposed rule requires the source to record daily average values for continuously monitored parameters. The daily average is the average of all of the 15-minute values generated by the continuous recorder during the operating day. If the daily average value is not in accordance with the established level, it must be reported. The daily averaging period was selected because the purpose of monitoring data is to ensure proper operation and maintenance of the control device. Because it often takes from 12 to 24 hours to correct a problem, this averaging period was considered to best reflect operation and maintenance practices. This averaging period therefore gives the owner or operator a reasonable period of time to take action. If a shorter averaging period (for example 3 hours) was selected, sources would be likely to have multiple excursions caused by the same operational problem because it would not be possible to correct problems in one 3-hour reporting period.

In the proposed rule, as in subpart G, at least 75 percent of monitoring data is required to constitute a valid day's worth of data. Excused excursions are not included in the proposed rule because most continuous monitoring system problems can be dealt with within the context of the startup, shutdown, and malfunction plan required under subpart A. For example, for continuous front-end process vents a source needs to have valid monitoring data for at least 75 percent of the operating hours in a given operating day to have a valid day's worth of monitoring data.

For back-end process operations complying using stripping, the proposed rule requires the source to calculate and record weekly average residual HAP contents. The primary reason for the selection of weekly averaging is related to the amount of time needed to quantify the residual HAP content in crumb samples. To be consistent with the control device parameter averaging, the EPA considered daily averaging. However, using the test methods being proposed by the EPA, it could take more than 24 hours to determine the residual HAP content of a crumb sample. The EPA did not feel that it was appropriate to have an averaging time shorter than the period required to determine the residual HAP content of a sample. In other words, the facility could be out of compliance with a daily average before the results of the analysis are known, eliminating any possibly for corrective action.

Failure to obtain a sample and determine the residual HAP content for at least 75-percent of the grades or batches processed in a week is an excursion. This level allows missed samples due to sampling problems, analytical problems, etc. The 75-percent level was selected to maintain consistency with the control device parameter monitoring provisions.

Consistent with the proposed parameter monitoring requirements for front-end process vents, the EPA is proposing that failure to provide sufficient monitoring data for at least 75 percent of required periods (batches or grades processed) is a violation of the standard. However, the definition of insufficient monitoring data for a grade or batch required further EPA consideration. For continuous front-end process vents, the period is an hour, and an hour is considered to have sufficient monitoring data only if four 15-minute parameter values are recorded. The EPA considered specifying that parameter values must be recorded for all 15-minute periods during the processing of a particular grade or batch to consider the batch or grade to have sufficient stripper monitoring data. However, given the fact that the stripping of one batch or grade could last for several hours, or even several days, the EPA concluded that this was unreasonable. Therefore, the EPA determined that failure to record parameter readings for 75-percent of the 15-minute periods during the processing of a grade or batch was a reasonable method of defining insufficient stripper monitoring data.

Whereas the HON allows excused excursions to reflect the uncertainty of parameter monitoring, the proposed rule does not allow excused excursions. Excused excursions are not included in the proposed rule because most continuous monitoring system problems can be dealt with in the context of the startup, shutdown, and malfunction plan required under subpart A. Parameter monitoring problems not addressed under the startup, shutdown, and malfunction plan will not result in an excursion if at sufficient data are available.

8.8 SELECTION OF RECORDKEEPING AND REPORTING REQUIREMENTS

The general recordkeeping and reporting requirements of this subpart are very similar to those found in subpart G of part 63. The proposed rule also relies of the provisions of subpart A of part 63. A table included in the proposed rule designates which sections of subpart A apply to the proposed rule.

The proposed rule would require sources to submit the following six types of reports:

1. Initial Notification,
2. Implementation Plan (if an operating permit application has not been submitted or, for new sources, an application for approval of construction or reconstruction),
3. Emissions Averaging Plan,
4. Notification of Compliance Status,
5. Periodic Reports, and
6. other reports.

The purposes of each of these reports are described in this section. More details on the content of these reports are provided in section 8.1.5.7. The wording of the proposed rule requires all draft reports to be submitted to the "Administrator". The term Administrator means either the Administrator of the EPA, an EPA regional office, a State agency, or other authority that has been delegated the authority to implement this rule. In most cases, reports will be sent to State agencies. Addresses are provided in subpart A of part 63.

Records of reported information and other information necessary to document compliance with the regulation are generally required to be kept for 5 years. A few records pertaining to equipment design would be kept for the life of the equipment.

8.8.1 Initial Notification

The proposed rule would require owners or operators who are subject the proposed rule to submit an Initial Notification. This report will establish an early dialog between the source and the regulatory agency, allowing both to plan for compliance activities.

8.8.2 Implementation Plan

The Implementation Plan details how the source plans to comply. Implementation Plans are only required for sources that have not submitted an operating permit application or application for approval of construction or reconstruction. An operating permit application would contain all the types of information required in the Implementation Plan, so it would be redundant to require sources to submit both.

8.8.3 Emissions Averaging Plan

The Emissions Averaging Plan is required 18 months prior to the compliance date to allow time for review and approval of the average. Because of the complexities and site-specific nature of emissions averaging, an approval process is necessary to assure that compliance through averaging would not result in greater hazard or risk than compliance without averaging and that the specific averaging plan will result in emissions credits outweighing debits. The Emissions Averaging Plans must be more detailed and thorough than an Implementation Plan. The additional information is necessary for the reviewing authority to make an informed decision about approving the average. The projected credits and debits included in the Emissions Averaging Plan may be based on calculations, design analyses, or engineering assessments instead of measured values. This flexibility is provided because, in many cases, control measures will not have been implemented at the time the plan is due, and actual measurements would not be possible.

8.8.4 Notification of Compliance Status

The Notification of Compliance Status contains the information necessary to demonstrate that compliance has been achieved, such as the results of performance tests, TRE determinations, and design analyses.

Sources with a large number of emission points are likely to be submitting results of multiple performance tests for each kind of emission point. For each test method used for a particular kind of emission point (e.g., a process vent), one complete test report would be submitted. For additional tests performed for the same kind of emission point using the same method, the results would be submitted, but a complete test report is not required. Results would include values needed to determine compliance (e.g., inlet and outlet concentrations, flow rates, percent reduction) as well as the values of monitored parameters averaged over the period of the test. The submission of one test report will allow the regulatory authority to verify that the source has followed the correct sampling and analytical procedures and has done calculations correctly. Complete test reports for other emission points may be kept at the plant rather than submitted. This reporting system was established to ensure that reviewing authorities have sufficient information to evaluate the monitoring and testing used to demonstrate compliance while minimizing the reporting burden.

Another type of information to be included in the Notification of Compliance Status is the specific level for each monitored parameter for each emission point, and the rationale for why this level indicates proper operation of the control device. (If this level has already been established in the operating permit, it does not need to be repeated in the Notification of Compliance Status). As an example, for a process vent controlled by an incinerator, the notification would include the site-specific minimum firebox temperature that will ensure proper operation of the incinerator, and the data and rationale to support this minimum temperature.

For emission points included in an emissions average, the notification would also include the measured or calculated values of all parameters needed to calculate emission credits and debits, and the result of the calculation for the first quarter. This information is needed to ensure that the points in the average are being controlled as described in the Emissions Averaging Plan and that the average itself is balancing as planned.

8.8.5 Periodic Reports

Periodic Reports are required to ensure that the standards continue to be met and that control devices are operated and maintained properly. Generally, Periodic Reports would be submitted semiannually, however, quarterly reports must be submitted in some instances.

Periodic Reports specify periods when the values of monitored parameters are above the maximum or below the minimum established level specified in the Notification of Compliance Status or operating permit. For continuously monitored parameters, records must be kept of the parameter value recorded once every 15 minutes. If a parameter is monitored more frequently than once every 15 minutes, the 15-minute averages may be kept instead of the individual values. This requirement ensures that there will be enough monitoring values recorded to be representative of the monitoring period without requiring the source to retain additional data on file and readily accessible.

For some types of emission points and controls, periodic (e.g., monthly, quarterly, or annual) inspections or measurements are required instead of continuous monitoring. Records that such inspections or measurements were done must be kept; but results are included in Periodic Reports only if a problem is found. This requirement is designed to minimize the recordkeeping and reporting burden of the proposed rule.

For emission points included in an emissions average, the results of the quarterly credit and debit calculation are also included in the Periodic Reports, so the reviewing authority can ensure that the quarterly requirements for the average have been met.

8.8.6 Other Reports

There are a limited number of other reports. Where possible, the proposed rule is structured to allow information to be reported in the semiannual (or quarterly) Periodic Reports. However, in a few cases, it is necessary for the source to provide information to the regulatory authority shortly before or after a specific event. For example, if a process change is made that causes a continuous or batch front-end process vent to change from Group 2 to Group 1, the source must report the change within 90 days. For storage vessels, notification prior to internal tank inspections is required to allow the regulatory authority to have an observer present. For storage and wastewater, if an owner or operator requests an extension of the repair period or a delay of repair, the request needs to be submitted separately from the Periodic Reports because the requests require a quick response from the reviewing authority. Certain notifications and reports required by subpart A of part 63 must also be submitted.

8.8.7 Possible Alternative Recordkeeping Requirements

The proposed rule requires sources to keep readily accessible records of monitored parameters. For those control devices and strippers that must be monitored continuously, records which include at least one monitored value for every 15 minutes of operation are considered sufficient. These monitoring records must be maintained for 5 years. However, there are some existing monitoring systems that might not satisfy these requirements. To comply with the proposed rule, sources have the flexibility to request approval for the use of alternative recordkeeping systems under the proposed rule or under provisions of subpart A of part 63.

8.9 OPERATING PERMIT PROGRAM

Under Title V of the 1990 Amendments, all HAP-emitting facilities subject to this rule will be required to obtain an operating permit. Oftentimes, emission limits, monitoring, and reporting and recordkeeping requirements are scattered among numerous provisions of State implementation plans (SIP's) or Federal regulations. As discussed in the proposed rule for the operating permit program published on May 10, 1991 (58 FR 21712), this new permit program would include in a single document all of the requirements that pertain to a single source. Once a State's permit program has been approved, each facility containing that source within that State must apply for and obtain an operating permit. If the State wherein the source is located does not have an approved permitting program, the owner or operator of a source must submit the application under the General Provisions of 40 CFR part 63.

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16. ABSTRACT

This document provides the background information and rationale for the decisions made in the (proposed) standards setting process for the elastomers manufacturing industry. The affected industry is described, the baseline organic HAP emissions are presented as are the predicted impacts associated with the selected regulatory alternatives. The rationale for the alternatives and the selected proposed standard is given.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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