

# Ethylene MACT Compliance Manual

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Olefins Environmental Issues Task Group, American Chemistry Council



**Prepared for the**

**American Chemistry Council's**  
**Olefins Environmental Issues Task Group**

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# Ethylene MACT Compliance Manual

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# Ethylene MACT Compliance Manual

## Chapter 1

### Purpose and Overview

#### Chapter 1 Index

- 1.1**    *Overview*
- 1.2**    *Document Organization*
- 1.3**    *Disclaimer*

#### 1.1 Overview

This document, a joint project of the U.S. Environmental Protection Agency (EPA) and the American Chemistry Council's Olefins Environmental Issues Task Group with support from the Texas Council on Environmental Quality and the Louisiana Department of Environmental Quality, is intended to help owners and operators of ethylene processes understand and comply with EPA's air pollution regulations promulgated on July 12, 2002, as amended on April 13, 2005 and April 20, 2006. These regulations contain new emissions standards for ethylene processes based on the "maximum achievable control technology" or MACT.

This document reviews the provisions of the Ethylene MACT regulation, including most referenced requirements. The requirements of the Benzene Waste Operations NESHAP (BWON) and Hazardous Organic NESHAP (HON), which are referenced by the Ethylene MACT, are discussed in less detail than are other referenced requirements. In many cases, requirements are summarized in tables or charts to facilitate a quicker review. This document, does not attempt to provide interpretations of the rule. In some cases, owners or operators may need to review specific issues relating to their particular production facilities with the appropriate regulating agency.

The Ethylene MACT rule was promulgated along with several other MACT rules as part of the existing Part 63 Subpart YY Generic MACT rule. A new Part 63 subpart (Subpart XX) was simultaneously promulgated and contains the requirements for ethylene process wastes and heat exchange systems. For simplicity and consistency, many of the specific requirements for various types of emissions were referenced in the Generic MACT. This manual attempts to bring all of the pertinent material together in one place.

The Ethylene MACT standard is intended to control the emissions of organic hazardous air pollutants or organic HAP from ethylene manufacturing processes. The applicable organic HAPs are defined by this standard in Table 1 of Part 63 Subpart XX. Table 1 is reproduced as Appendix D in this manual. When the term "organic HAP" or "Appendix D organic HAP" is used in this manual, it refers to the compounds listed in Appendix D of this manual.

#### 1.2 Document Organization

The chapters in this document are:

#### **Chapter 2 – Applicability, Definitions and Compliance Dates**

Chapter 2 covers rule applicability and exceptions including associated applicability requirements from the General Provisions of Part 63 and from §63.1100 and 63.1102 of Subpart YY. Chapter 2 includes a discussion of the sources of the definitions applicable to Ethylene MACT. A comprehensive list of applicable definitions is included in the manual as Appendix A. The chapter also reviews compliance dates and other key timing items. The chapter reviews the general provision applicability to Ethylene MACT and summarizes the general requirements from the General Provisions and the Generic MACT that are not covered elsewhere in the manual.

**Chapter 3 - Storage Tanks, Surge Control Vessels and Bottoms Receivers**

Chapter 3 reviews applicability of Ethylene MACT to storage tanks. Tabular reference to requirements derived from Part 63 Subpart WW for floating roofs is provided with reference to requirements in Chapter 9 for closed vent systems and control devices as used for storage vessel compliance. Special compliance timing for floating roof installations is summarized. Surge control vessels and bottoms receivers are included in the definition of storage vessel and thus are subject to the same requirements as storage vessels

**Chapter 4 - Process Vents**

Chapter 4 reviews applicability of Ethylene MACT to process vents. Requirements in Chapter 9 for closed vent systems and control devices that are used for process vent compliance are referenced.

**Chapter 5 - Equipment Leaks**

Chapter 5 reviews applicability of Ethylene MACT to equipment leak components and procedures for identifying subject components. Tabular or diagram reference to requirements as specified in §63.1107 and Part 63 Subpart UU is provided. Requirements in Chapter 9 for closed vent systems and control devices as used for equipment leak control are referenced.

**Chapter 6 - Transfer Operations**

Chapter 6 reviews applicability of Ethylene MACT to transfer operations. Tabular or diagram references to requirements in §63.1105 is provided and Chapter 9 is referenced for closed vent systems and control devices used for compliance with the transfer operation requirements.

**Chapter 7 - Waste Operations**

Chapter 7 reviews applicability of Ethylene MACT to wastes and wastewaters. The chapter discusses use of the BWON regulation with changes and additions to the requirements of BWON for Ethylene MACT compliance. New and changed BWON requirements associated with offsite transfers and the inclusion of butadiene streams and BWON sites with a Total Annual Benzene (TAB) of <10 Mg are reviewed in detail.

**Chapter 8 - Heat Exchange Systems**

Chapter 8 reviews applicability of Ethylene MACT to heat exchange systems and discusses procedures for identifying subject heat exchange systems.

**Chapter 9 - Closed Vent Systems and Control Devices**

Chapter 9 reviews, in detail, closed vent system and control device requirements from Part 63 Subpart SS and other applicable regulations as referenced and modified by the Ethylene MACT and Generic MACT. Data handling and continuous monitoring system requirements are included. Compilation of flare requirements, per the requirements of Subpart SS, is provided in Appendix C.

**Chapter 10 – Startup, Shutdown and Malfunction (SS&M)**

Chapter 10 reviews SS&M requirements from §63.1108 and §63.1111. Differences with Part 63 General Provisions SS&M requirements are discussed, including the requirement to address ethylene process furnace decoking emissions.

**Chapter 11 - Recordkeeping**

Chapter 11 provides recordkeeping requirements from §63.1109 (and Part 63 General Provisions) as modified by the Ethylene MACT and the referenced subparts. An overall tabulation of all potentially required records is provided

**Chapter 12 - Reporting**

Chapter 12 provides reporting requirements from §63.1110 (and Part 63 General Provisions), as modified by the Ethylene MACT and referenced subparts. An overall tabulation showing all potentially required reports and their content is provided

**Appendices**

Appendix A – Contains a master list of definitions.

Appendix B – Contains a copy of §63.1103(e)(3), including Table 7 of Subpart YY.

Appendix C – Provides a review of flare requirements.

Appendix D – Contains a copy of Table 1 of 40 CFR Part 63, Subpart XX – the Ethylene MACT organic Hazardous Air Pollutant list.

**1.3 Disclaimer for the Use of this Guide**

The statements in this document are intended solely for compliance assistance. This document is to be used in conjunction with the regulations, not in place of them. It is not intended, nor can it be relied on, to create any rights enforceable by any party in litigation with the United States. The U.S.

Environmental Protection Agency (EPA) and State officials may decide to follow the guidance provided in this document, or to act in variance with it, based on analysis of specific site circumstances. This guidance may be revised without public notice to reflect possible rule changes and changes in EPA's policy.

Please be aware that EPA has made its best effort to present an accurate summary of the regulatory requirements in the Ethylene and Generic MACTs. Note that it is not intended to summarize every option and detail of the rule. Finally, in the event that there are typing errors or deviations from the final rule, the final rule stands.

# Ethylene MACT Compliance Manual

## Chapter 2

### Applicability, Definitions, Compliance Dates

#### Chapter 2 Index

- 2.1 *Overview*
- 2.2 *Structure of the Rule*
- 2.3 *Applicability and Requirements*
- 2.4 *Definitions*
- 2.5 *Compliance Dates*
- 2.6 *Overlap with Other Regulations*
- 2.7 *Other General Requirements*
- 2.8 *Recordkeeping*
- 2.9 *Reporting*

#### 2.1 Overview

Ethylene MACT, promulgated as part of the Part 63 Subpart YY Generic MACT, applies to chemical manufacturing process units in which ethylene and/or propylene are produced by separation from petroleum refining process streams or by subjecting hydrocarbons to high temperatures in the presence of steam. Processes and equipment that are subject to the Refining MACT 1 (Part 63 Subpart CC) or the Hazardous Organic NESHAP, HON, (Part 63 Subparts F, G, and H) are exempt from Ethylene MACT. New sources must be in compliance upon startup of the new source.

Existing ethylene production sources must comply with the requirements of Ethylene MACT by July 12, 2005.

Control requirements are imposed for Appendix D organic HAP-containing emissions from storage vessels, process vents, transfer operations, equipment leaks, wastes, and heat exchange systems that meet specified criteria. Provisions are also provided for closed vent systems and control devices and for startup, shutdown and malfunction operations.

#### 2.2 Structure of the Rule

Ethylene MACT is included Part 63 Subpart YY, the Generic MACT standard. Some sections of Subpart YY deal with specific emission types and others contain general information. The sections of Subpart YY are listed below and the location in this manual where they are addressed is indicated.

§63.1100 Applicability (Chapter 2, except (e) and (g) are discussed in other chapters)

§63.1101 Definitions (Chapter 2)

§63.1102 Compliance Schedule (Chapter 2)

§63.1103(e) Ethylene production specific applicability, definitions and requirements. (Chapter 2)

§63.1104 Process vents from continuous unit operations: applicability assessment procedures and methods. (Chapter 4)

§63.1105 Transfer Racks (Chapter 6)

§63.1106 Wastewater provisions (Not applicable to Ethylene MACT)

§63.1107 Equipment leaks: applicability assessment procedures and methods (Chapter 5)

§63.1108 Compliance with standards and operation and maintenance requirements (Chapters 2 and 10)

§63.1109 Recordkeeping requirements (Chapter 11)

§63.1110 Reporting requirements (Chapter 12)

§63.1111 Startup, shutdown and malfunction (Chapter 10)

§63.1112 Extension of compliance, and performance test, monitoring, recordkeeping and reporting waivers and alternatives. (Chapter 2 and 9)

§63.1113 Procedures for approval of alternative means of emission limitation. (Chapter 2)

§63.1114 Implementation and enforcement. (Chapter 2)

Because Subpart YY contains requirements typically covered in the Part 63 General Provisions, only a limited number of the Part 63 General Provisions apply. Specifically, §63.1100(b) of Subpart YY specifies that only §63.1 through §63.5 and §63.12 through §63.15 of the Part 63 General Provisions apply to Generic MACT categories. Those sections of the Part 63 General Provisions are listed below and the chapter in this manual where they are addressed is indicated.

§63.1 Applicability (Chapter 2)

§63.2 Definitions (Chapter 2)

§63.3 Units and abbreviations (Not addressed in this manual).

§63.4 Prohibited activities and circumvention (Chapter 2)

§63.5 Preconstruction review and notification requirements. (Chapter 2 and Chapter 12)

§63.12 State authority and delegations (Chapter 2)

§63.13 Addresses of State air pollution control agencies and EPA Regional Offices (Not addressed in this manual)

§63.14 Incorporations by reference (Not addressed in this manual)

§63.15 Availability and confidentiality (Not addressed in this manual)

**2.3 Applicability and Requirements**  
(§63.1100 and 1103(e))

Subpart YY of Part 63, the Generic MACT, applies to eight source categories of manufacturing processes. One of these categories is the ethylene production category.

NOTE: §63.1100(c) contains a general exclusion for research and development facilities (see definition in Appendix A) from Subpart YY applicability. Thus, research and development facilities at ethylene production sources are exempted from the MACT.

§63.1100 of Subpart YY contains applicability information that applies to all of the source categories covered by Generic MACT and pointers to source category specific requirements. §63.1103(e) contains the source category specific applicability and requirements information for the ethylene production category.

Subpart YY provides a procedure in §63.1100(d)(4) for establishing the primary product of a process that makes multiple products, in order to determine if the process is covered by one of the Generic MACT source categories. That determination process is not reviewed here, since most ethylene production units will not need to use it. Similarly, §63.1100(d)(5), which deals with requirements for flexible operations, that make Subpart YY products as well as other products, is not discussed in this manual.

§63.1100 also deals with rules for assigning equipment to the Subpart YY source categories. The rules for storage vessels are reviewed in Table 3-3 of Chapter 3 of this manual. The rules for recovery operations are contained in Table 2-2 at the end of this chapter.

The affected source for Ethylene MACT is the collection of the emission points listed below that are associated with ethylene production at a major source of HAP.

Emission points included in the ethylene production affected source are:

- All storage vessels (as defined in §63.1101) that store liquids containing Appendix D organic HAP.
- All ethylene process vents (as defined in §63.1103(e)(2)) from continuous unit operations.
- All transfer racks (as defined in §63.1103(e)(2)) that load Appendix D organic HAP-containing material.
- Equipment (as defined in §63.1101) that contains or contacts Appendix D organic HAP.
- All waste streams (as defined in §63.1103(e)(2)) associated with an ethylene production unit.
- All heat exchange systems (as defined in §63.1103(e)(2)) associated with an ethylene production unit.
- All ethylene cracking furnaces and associated decoking operations.

Exceptions:

- Process units and emission points subject to the HON (except as described in the overlap provisions in the waste chapter of this manual) and Refining MACT 1 are not part of the Ethylene MACT affected source.

NOTE: Because of this exemption, overlap provisions addressing the HON and Refining MACT 1 in referenced subparts are superfluous, except for those addressing shared waste management equipment.

The following are part of the ethylene production affected source but are not subject to any requirements in §63.1103(e)(3).

Note: Since the exception is limited to requirements from paragraph (e)(3), SS&M provisions would still apply.

- Equipment that is located within an ethylene production unit, but does not contain Appendix D organic HAP.
- Stormwater from segregated sewers.
- Water from fire-fighting and deluge systems in segregated sewers.
- Spills.
- Water from safety showers.
- Water from testing of fire-fighting and deluge systems.
- Vessels storing organic liquids that contain Appendix D organic HAP as impurities.
- Transfer racks, loading arms, or loading hoses that only transfer liquids containing Appendix D organic HAP as impurities.
- Transfer racks, loading arms, or loading hoses that vapor balance during all transfer operations.
- Air emissions from all ethylene cracking furnaces, including emissions during decoking operations.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.
- Vessels permanently attached to motor vehicles such as trucks, railcars, barges, or ships.

Emission points, meeting specific criteria, of the rule in ethylene production processes must be controlled as specified in §63.1103(e)(3). New sources and existing sources have different requirements. See 2.4 for definitions of these terms. §63.1103(e)(3) contains text and a table (Table 7) that indicates the requirements. Because of its critical importance, a copy of §63.1103(e)(3) is attached as Appendix B.

General Requirement Applicability

Per §63.1108(a), the requirements of §63.1103(e) apply at all times except during periods of startup, shutdown and malfunction (SS&M) and periods of non-operation of the ethylene production process (or portions thereof) when emissions cease. Equipment leak requirements do not apply during SS&M, process unit shutdown, and non-operation when the equipment is drained and depressured such that potential emissions cease. Requirements associated with periods of SS&M are discussed in Chapter 10 of this manual.

§63.1108(b)(4) requires that, unless otherwise specified, control applicability assessments be based on the average of three runs using the applicable test method. If a test run is unusable for one of the following reasons, a replacement test run may be used, after receiving approval.

- A sample is accidentally lost after the testing team leaves the site; or
- Conditions occur in which one of the three runs must be discontinued because of forced shutdown; or
- Extreme meteorological conditions occur; or
- Other circumstances occur that are beyond the owner or operator's control.

Preconstruction Review Requirements

After July 12, 2002 the preconstruction review requirements in §63.5 apply to the owner or operator of a new ethylene production affected source and a reconstructed ethylene production affected source that is major-emitting (for HAP). A new affected ethylene production source for which construction commenced after December 6, 2000 is subject to the Ethylene MACT standards for new affected sources, including compliance dates. An ethylene production source for which reconstruction commenced after December 6, 2000 is subject to relevant standards for new sources, including compliance dates, irrespective of any change in emissions of hazardous air pollutants from that source.

After July 12, 2002, no person may, without obtaining written approval in advance from the Administrator in accordance with the procedures specified in §63.5, do any of the following:

- Construct a new ethylene production source that is major-emitting and subject to Ethylene MACT;
- Reconstruct an ethylene production source that is major-emitting and subject to Ethylene MACT; or
- Reconstruct a major source such that the source becomes an ethylene production affected source that is major-emitting and subject to Ethylene MACT.

After the July 12, 2002, an owner or operator who constructs a new ethylene production affected source that is not major-emitting or reconstructs an ethylene production affected source that is not major-emitting that is subject to Ethylene MACT, or reconstructs a source such that the source becomes an ethylene production affected source subject to Ethylene MACT, must notify the Administrator of the intended construction or reconstruction. The notification must be submitted in accordance with the procedures in §63.9(b).

After the July 12, 2002, equipment added (or a process change) to an ethylene production affected source that is within the scope of the definition of affected source under Ethylene MACT must be considered part of the affected source and is subject to all provisions of the Ethylene MACT established for that affected source.

**2.4 Definitions**

Appendix A provides a consolidated list of definitions applicable to the Ethylene MACT. The source of each definition and any provisos associated with it are indicated in parenthesis at the end of the definition. Where a term is defined in General Provisions, Subpart YY and/or the Ethylene MACT portion of Subpart YY (i.e., §63.1103(e)) the most specific section generally controls (e.g. definitions in the Ethylene MACT section of Subpart YY supersedes a definition for the same term in

§63.1101 of Subpart YY and/or in §63.2 of the General Provisions). For applicability terms (e.g. storage tank) defined both in Subpart YY and subparts referenced from Subpart YY (e.g., SS, UU or WW), the Subpart YY definition is assumed to supersede for the purpose of identifying equipment subject to the requirements of the referenced subpart.

Until the amendments of April 20, 2006, the definition of “malfunction in §63.1101 was different than that in §63.2, in that it did not contain the excess emission test. However, since April 20, 2006 the definitions have been identical.

For Ethylene MACT waste (including wastewater) and heat exchange system requirements, §63.1082(a) specifies that the definitions from §63.1103(e) and §61.341 of the Benzene Waste Operations NESHAP (BWON) apply. There are some differences in definitions between §61.341 and the definitions applicable to other Ethylene MACT emission types. These differences should be carefully considered when implementing the waste provisions. Additionally, definitions from §61.2 (Part 61 General Provisions) will apply to the waste requirements in BWON, instead of the definitions from §63.2, which apply everywhere else.

A few key definitions critical to applicability are as follows:

*Ethylene production or production unit* means a chemical manufacturing process unit in which ethylene and/or propylene are produced by separation from petroleum refining process streams or by subjecting hydrocarbons to high temperatures in the presence of steam. The ethylene production unit includes the separation of ethylene and/or propylene from associated streams such as a C4 product, pyrolysis gasoline, and pyrolysis fuel oil. Ethylene production does not include the manufacture of SOCOMI chemicals such as the production of butadiene from the C4 stream and aromatics from pyrolysis gasoline. (§63.1103(e)(2))

NOTE: The preamble to the proposed rule describes the ethylene production source category at 65 FR 76425 as follows:

“The Ethylene Production source category includes any facility which manufactures ethylene as a primary product or an intermediate product. Ethylene is produced by either a pyrolysis process (hydrocarbons subjected to high temperatures in the presence of steam) or by separation from a petroleum refining stream. The ethylene production process includes the separation of ethylene from associated streams such as product made from compounds composed of four carbon atoms (C4), pyrolysis gasoline, and pyrolysis fuel oil. The ethylene production process does not include the manufacture of synthetic organic chemicals, such as the production of butadiene from the C4 stream and aromatics from pyrolysis gasoline. Propylene is often produced as a product during the ethylene production process, but the separation of propylene from a refinery gas stream does not in itself cause the process unit or the equipment used for the separation to be included in this source category.

In addition to ethylene and propylene, other products from an ethylene manufacturing process unit (EMPU) may include, but are not limited to: (1) Hydrogen and methane containing streams, (2) ethane and propane streams, (3) mixed C4+ pyrolysis products, (4) pyrolysis fuel oil, and (5) specialty products such as acetylene and methylacetylene/propadiene.”

NOTE: A record is required for ethylene production units (see definition in 2.4) that conclude they are not subject to the Ethylene MACT.

*Existing source* means any affected source that is not a new source. (§63.2)



*New source* means any affected source the construction or reconstruction of which is commenced after the Administrator first proposes a relevant emission standard under [Part 63] establishing an emission standard applicable to such source. (§63.2)

NOTE: Since the Ethylene MACT was first proposed on December 6, 2000, a new ethylene production unit is one for which construction or reconstruction commenced after December 6, 2000.

NOTE: The only differences in requirements for a new ethylene affected source versus an existing ethylene affected source are in the process vent and heat exchange areas

### **2.5 Compliance Dates and Timelines**

An existing ethylene production source must comply with the requirements of Ethylene MACT by July 12, 2005.

Ethylene production sources that commenced construction or reconstruction after December 6, 2000 and that had an initial startup before July 12, 2002, had to comply with Ethylene MACT by July 12, 2002.

Ethylene production sources that commenced construction or reconstruction after December 6, 2000, but before July 12, 2002, may comply with the final Ethylene MACT by July 12, 2005, if the promulgated Ethylene MACT is more stringent than the proposed Ethylene MACT and the ethylene production source complies with Ethylene MACT, as proposed, between July 12, 2002 and July 12, 2005.

Ethylene production sources that commence construction or reconstruction after July 12, 2002 have to comply with Ethylene MACT upon startup.

An ethylene production source at an area source that increases its emissions of (or its potential to emit) HAP such that the source becomes a major source must comply with Ethylene MACT for the ethylene production process within 3 years of becoming a major source.

All terms that define a period of time for completion of required tasks (e.g., weekly, monthly, quarterly, annually), unless specified otherwise in the section or subsection that imposes the requirement, refer to standard calendar periods. Also, time periods specified in days are calendar days, even if the word “calendar” is absent, unless otherwise specified in an applicable requirement.

Notwithstanding time periods specified for completion of required tasks, time periods may be changed by mutual agreement between the owner or operator and the Administrator, as specified in §63.1110(h). For each time period that is changed by agreement, the revised period shall remain in effect until it is changed. A new request is not necessary for each recurring period.

When the period specified for compliance is a standard calendar period, if the initial compliance date occurs after the beginning of the period, compliance is required as follows:

- Compliance is required before the end of the standard calendar period within which the compliance deadline occurs, if there remain at least 3 days for tasks that must be performed weekly, at least 2 weeks for tasks that must be performed monthly, at least 1 month for tasks that must be performed each quarter, or at least 3 months for tasks that must be performed annually; or
- In all other cases, compliance is required before the end of the first full standard calendar period after the period within which the initial compliance deadline occurs.

Where a provision requires completion of a task during each of multiple successive periods, an owner or operator may perform the required task at any time during the specified period, provided the task is conducted at a reasonable interval after completion of the task during the previous period.

Subpart YY provides procedures for obtaining compliance extensions. Such extensions are available due to participation in the HAP early reduction program and if BACT or LAER has been installed prior to July 12, 2002 for the same pollutant or stream of pollutants for an emission point regulated by Ethylene MACT. Refer to §63.1112(a) for details, including notification and approval requirements.

**2.6 Overlap with Other Regulations**  
(§63.1100(g))

§63.1100(g) deals with overlaps of Generic MACT and thus Ethylene MACT with other regulations. Most overlaps are emission-type specific and are addressed in the other chapters of this manual. Overlaps addressed are shown in Table 2-1.

Overlaps with Part 63 Subpart F, G and H (the HON) and Subpart CC (Refining MACT 1) are addressed in §63.1100(g), but are generally not applicable to Ethylene MACT since emission points subject to those regulations are excluded from the ethylene MACT affected source.

**Table 2-1 Overlaps Addressed by §63.1000(g)**

Emission	Citation	Manual Discussion
Storage	§63.1100(g)(1)	Section 3.3
Process Vents	§63.1100(g)(2)	Section 4.3
Transfers	§63.1100(g)(3)	Section 6.3
Equipment Leaks	§63.1100(g)(4)	Section 5.3
Wastewater	§63.1100(g)(5)	Not applicable
Waste, including wastewater	§63.1100(g)(6)	Section 7.3

**2.7 Other General Requirements**

With the exception of information protected through the CBI provisions, all reports, records, and other information collected by the Administrator under Part 63 are available to the public. In addition, a copy of each permit application, compliance plan (including the schedule of compliance), notification of compliance status, excess emissions and continuous monitoring systems performance report, and Title V permit is available to the public, consistent with CBI protections recognized in Section 503(e) of the Act.

§63.1112(c) provides procedures for obtaining approval to use alternative monitoring and test methods, alternative relative accuracy tests and waivers of recordkeeping and reporting requirements. Refer to those sections of the Generic MACT for details.

Procedures for obtaining approval of an alternative means of emission limitation are included in §63.1113. This approval requires Federal Register notice and comment.

§63.1114 specifies implementation and enforcement authority information. It specifies that the following, applicable to Ethylene MACT, may not be delegated by EPA:

- Approval of alternatives to the nonopacity emissions standards in §63.1103(a)(3), (b)(3) through (5), (c)(3), (d)(3), (e)(3), (f)(3), (g)(3) and (4), and (h)(3) under §63.6(g). Follow the requirements in §63.1113 to request permission to use an alternative means of emission limitation. Where these standards reference another subpart, the cited provisions will be delegated according to the delegation provisions of the referenced subpart.

NOTE: Other delegation exemptions specific to closed vent systems and control devices are contained in Subpart SS and are discussed in Section 9.12 of this manual.

§63.4 addresses circumvention and fragmentation. It prohibits the building, erecting, installing, or use of any article, machine, equipment, or process to conceal an emission that would otherwise constitute noncompliance with a relevant standard. It also specifies that fragmentation after November 15, 1990 which divides ownership of an operation, within the same facility among various owners where there is no real change in control, will not affect applicability. You must not use fragmentation or phasing of reconstruction activities (i.e., intentionally dividing reconstruction into multiple parts for purposes of avoiding new source requirements) to avoid becoming subject to new source requirements.

**2.8 Recordkeeping**

Records must be maintained as specified in §63.1109 of Subpart YY and must be readily available for inspection. Most records must be maintained for 5 years. These requirements are discussed in Chapter 11. Specific recordkeeping requirements associated with applicability and other topics discussed in this chapter are included in Chapter 11.

**2.9 Reporting**

Specific notification and reporting requirements associated with applicability and other requirements discussed in this chapter are included in Chapter 12.

**Table 2-2**  
**Recovery Operation Assignment to Process Unit**  
**(§63.1100(f))**

<p>(f) Recovery operation equipment ownership determination. To determine the process unit to which recovery equipment shall belong, the owner or operator shall sequentially follow the procedures specified in paragraphs (f)(1) through (7) of this section, stopping as soon as the determination is made.</p>
<p>(1) If recovery operation equipment is already subject to another subpart of this part on the date standards are promulgated for an affected source, that recovery operation equipment shall belong to the process unit subject to the other subpart.</p>
<p>(2) If recovery operation equipment is used exclusively by a single process unit, the recovery operation shall belong to that process unit.</p>
<p>(3) If recovery operation equipment is shared among process units, then the recovery operation equipment shall belong to that process unit that has the greatest input into or output from the recovery operation equipment (i.e., that process unit has the predominant use of the recovery operation equipment).</p>
<p>(4) If predominant use cannot be determined for recovery operation equipment that is shared among process units and if one of those process units is a process unit subject to this subpart, the recovery operation equipment shall belong to the process unit subject to this subpart.</p>
<p>(5) If predominant use cannot be determined for recovery operation equipment that is shared among process units and if more than one of the process units are process units that have different primary products and that are subject to this subpart, then the owner or operator shall assign the recovery operation equipment to any one of those process units.</p>
<p>(6) If the predominant use of recovery operation equipment varies from year to year, then the predominant use shall be determined based on the utilization that occurred during the year preceding the promulgation date of standards for an affected source under this subpart or based on the expected utilization for the 5 years following the promulgation date for standards for an affected source under this subpart for existing affected sources, whichever is the more representative of the expected operations for the recovery operations equipment, and based on the expected utilization for the first 5 years after initial startup for new affected sources. This determination shall be reported in the Notification of Compliance Status Report required by §63.1110(a)(4). If the predominant use changes, the redetermination of predominant use shall be reported in the next Periodic Report.</p>
<p>(7) If there is an unexpected change in the utilization of recovery operation equipment that could reasonably change the predominant use, the owner or operator shall redetermine to which process unit the recovery operation belongs by reperforming the procedures specified in paragraphs (f)(2) through (6) of this section.</p>

# Ethylene MACT Compliance Manual

## Chapter 3

### Storage Tanks, Surge Control Vessels and Bottoms Receivers

#### Chapter 3 Index

- 3.1 *Overview*
- 3.2 *Structure of the Rule*
- 3.3 *Applicability*
- 3.4 *Definitions*
- 3.5 *Floating Roof Storage Tank Options*
- 3.6 *Seal Design & Inspection*
- 3.7 *Deck Fittings*
- 3.8 *Inspection Procedures*
- 3.9 *Repair Requirements*
- 3.10 *Operational Requirements*
- 3.11 *Alternative Controls*
- 3.12 *Recordkeeping*
- 3.13 *Reporting*

#### 3.1 Overview

These requirements apply to storage tanks (or storage vessels) used to store liquids containing Appendix D organic HAP at ethylene production process units. Storage tanks subject to controls are required either to be vented to a control device (flare or non-flare), to a process, or to a fuel gas system or to be equipped with an internal or external floating roof that meets specified design, operation and inspection requirements. Some vessels are exempt from control requirements.

NOTE: Surge control vessels and bottoms receivers are included in the definition of storage vessel and thus are subject to the same requirements as storage vessels.

#### 3.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in Table 7 of §63.1103(e) that, unless exempted under §63.1103(e)(1)(ii), each storage vessel that stores liquid containing Appendix D organic HAP must control

storage emissions by venting the vessel through a closed vent system to a control device, and comply with Part 63 Subpart SS; or for certain storage tanks comply with the floating roof storage tank requirements in Subpart WW. Specific requirements depend upon the capacity of the tank and the vapor pressure of the organic HAP. This chapter discusses the requirements for floating roof storage tanks as codified in Part 63 Subpart WW. See Chapter 9 of this manual for requirements for emissions routed to a process or to a fuel gas system and for emissions sent to a control device.

Sections of Subpart WW are as follows:

- §63.1060 Applicability
- §63.1061 Definitions
- §63.1062 Storage vessel control requirements
- §63.1063 Floating roof requirements
- §63.1064 Alternative means of emissions limitation
- §63.1065 Recordkeeping
- §63.1066 Reporting
- §63.1067 Implementation and enforcement

#### 3.3 Applicability (§63.1103(e))

The Ethylene MACT applies to each storage vessel that is used to store liquid containing any of the organic HAP listed in Appendix D.

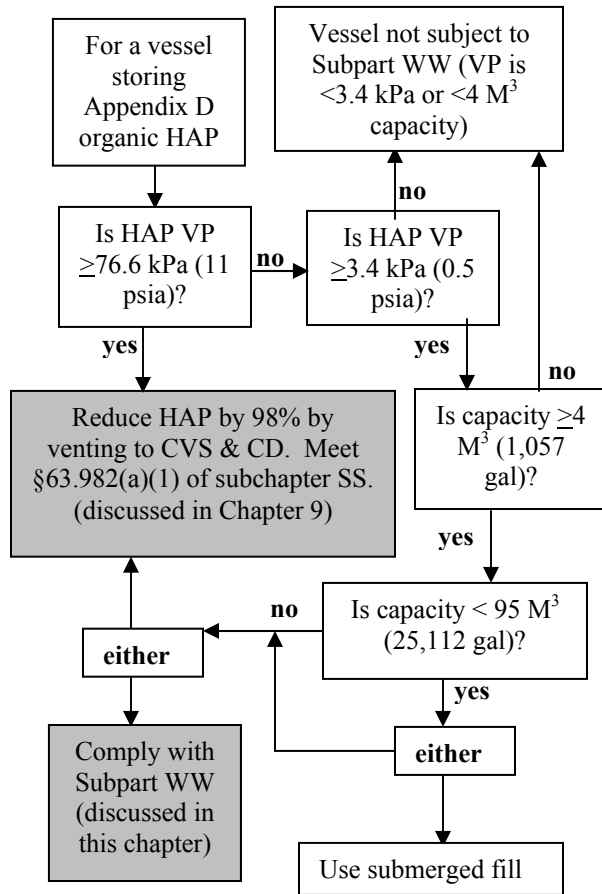
Specific requirements depend upon the vapor pressure of the HAP stored and the vessel size. See Figure 3-1.

Exceptions – these storage tanks are not subject to the storage vessel requirements:

- Storage vessels that only store liquids containing Appendix D organic HAP as impurities,
- Pressure vessels designed to operate in excess of 204.9 kilopascals (29.7 psia) and without emissions to the atmosphere.

- Vessels permanently attached to motor vehicles such as trucks, railcars, barges, or ships.
- Wastewater storage vessels.

**Figure 3-1**  
**Storage Tanks Control Applicability**  
 63.1103(e)(3) Table 7



Determination of Storage Tank Assignment to Process Units:

See Table 3-3 at the end of this chapter if there is uncertainty in determining whether or not a storage tank is a part of the ethylene process unit or some other unit.

The HAP vapor pressure in Figure 3-1 is the “maximum true vapor pressure” of the stored Appendix D organic HAP as defined by Subpart YY (see definition below). It is the sum of the partial pressures at the maximum storage temperature of the Appendix D organic HAPs contained in the stored liquid.

In the following examples, the partial pressure of HAP in the stored liquid is estimated as the mol fraction of the HAP times its pure component vapor pressure at the storage temperature.

Example 1: For crude butadiene (or crude C4s), typically the only HAP in the stream is 1,3-butadiene (1,3-BD). The maximum true vapor pressure of the HAP for ambient and refrigerated storage of typical crude butadiene is shown below.

Mol% 1,3-BD	Maximum Annual Storage Temp, °F	Pure Component VP, psia	HAP, max true Vapor Pressure, psia
50	100	60	30
50	40	28	14

Overlap with other Storage Tank Regulations:

- Storage tanks that must be controlled according to Part 60, Subpart Ka or Kb and the storage tank requirements for ethylene processes are required to comply only with the requirements for Ethylene MACT storage tanks.

Example 2: The maximum true vapor Pressure for pyrolysis gasoline (Pyrolysis C5+) at 100 °F is estimated below as 2.6 psia or about 18 kPa.

Component (Appendix D Organic HAP Only)	Mol %	Pure Comp VP, psia	Partial Press, psia
1,3-BD	2	60	1.2
Hexane	3	5	0.15
Benzene	40	3	1.2
Toluene	8	1	0.08
Cumene	0.03	0.2	0.00
Xylenes	3	0.3	0.009
Ethylbenzene	2	0.4	0.008
Styrene	5	0.2	0.01
Naphthalene	0.5	<0.002	0.00
HAP Maximum True Vapor Pressure			2.6

### 3.4 Definitions (§63.1061)

Definitions applicable to ethylene process storage tanks can be found in §63.1061, §63.1103(e)(2) and Appendix A of this manual. Two of the definitions are repeated here due to their importance to this chapter.

- *Storage vessel or tank*, for the purposes of regulation under the storage vessel provisions of Subpart YY, means a stationary unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) that provides structural support and is designed to hold an accumulation of liquids or other materials. Storage vessel includes surge control vessels and bottoms receiver vessels. For the purposes of regulation under the storage vessel provisions of Subpart YY, storage vessel does not include vessels permanently attached to motor vehicles such as trucks, railcars, barges, or ships; pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere; or wastewater storage vessels. Wastewater storage vessels are covered under the wastewater provisions of §63.1106.

- *Maximum true vapor pressure* means the equilibrium partial pressure exerted by the total organic HAP in the stored or transferred liquid at the temperature equal to the highest calendar-month average of the liquid storage or transfer temperature for liquids stored or transferred above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for liquids stored or transferred at the ambient temperature, as determined:

(1) In accordance with methods described in American Petroleum Institute Publication 2517, Evaporation Loss From External Floating-Roof Tanks (incorporated by reference as specified in §63.14 of Subpart A of [Part 63]); or

(2) As obtained from standard reference texts; or

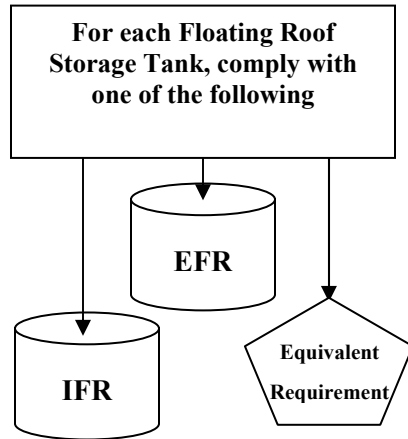
(3) As determined by the American Society for Testing and Materials Method D2879–83 (incorporated by reference as specified in §63.14 of Subpart A of [Part 63]); or

(4) Any other method approved by the Administrator.

### 3.5 Floating Roof Storage Tank Options (§63.1062)

Storage tanks that are required by the applicability of Subpart YY (Figure 3-1) to be controlled and owners or operators opt to use floating roofs, must comply with Subpart WW requirements for floating roof storage tanks. These tanks can be equipped with compliant Internal Floating Roofs (IFR), External Floating Roofs (EFR) or can comply with “Equivalent Requirements” described in the rule (Figure 3-2). Each of these requirements is described in detail in this chapter.

**Figure 3-2**  
**Floating Roof Options**  
**63.1062**



### 3.6 Seal Design and Inspection (§63.1063)

The seal design and inspection schedules for IFR and EFR tanks are shown in Figure 3-3 and Figure 3-4 at the end of this chapter.

### 3.7 Deck Fittings (§63.1063(a)(2))

Deck openings in IFR and EFR storage tank roofs shall be equipped as shown in Table 3-1. If the floating roof does not meet the requirements listed in Table 3-1 as of December 6, 2000, the Table 3-1 requirements do not apply until the next time the vessel is completely emptied and degassed, or 10 years after the promulgation date (by July 12, 2012) whichever occurs first.

### 3.8 Inspection procedures (§63.1063(c),(d))

The inspection procedures for IFR and EFR tanks are shown in Table 3-2.

### 3.9 Repair Requirements (§63.1063(e))

If inspections done according to the inspection procedures described in Table 3-2 indicate failures, then,

- If the inspection is performed while the storage vessel is not storing liquid, repairs must be completed before the refilling of the storage vessel with liquid.

- If the inspection is performed while the storage vessel is storing liquid, repairs must be completed or the vessel removed from service within 45 days. If a repair cannot be completed and the vessel cannot be emptied within 45 days, the owner or operator may use up to 2 extensions of up to 30 additional days each. Documentation of a decision to use an extension must include a description of the failure, document that alternate storage capacity is unavailable, and specify a schedule of actions that will ensure that the control equipment will be repaired or the vessel will be completely emptied as soon as practical.

### 3.10 Operational Requirements

(§63.1063(b))

Operational requirements apply to floating roof tanks as follows:

- The floating roof shall float on the stored liquid surface at all times, except when the floating roof is supported by its leg supports or other support devices (e.g., hangers from the fixed roof).
- When the storage vessel is storing liquid, but the liquid depth is insufficient to float the floating roof, the process of refloating the floating roof shall be continuous and shall be performed as soon as practical.
- Each cover over an opening in the floating roof, except for automatic bleeder vents (vacuum breaker vents) and rim space vents, shall be closed at all times, except when the cover must be open for access.
- Each automatic bleeder vent (vacuum breaker vent) and rim space vent shall be closed at all times, except when required to be open to relieve excess pressure or vacuum, in accordance with the manufacturer's design.
- Each unslotted guidepole cap shall be closed at all times except when gauging the liquid level or taking liquid samples.



**3.11 Alternative Controls (§63.1064)**

Alternative controls may be substituted for the floating roof seals and deck fittings if the alternative has an emission factor less than or equal to the factor for the specified equipment. Written requests for use of alternative controls, including emissions test results must be submitted to EPA for approval prior to use. See §63.1064.

**3.12 Recordkeeping (§63.1065)**

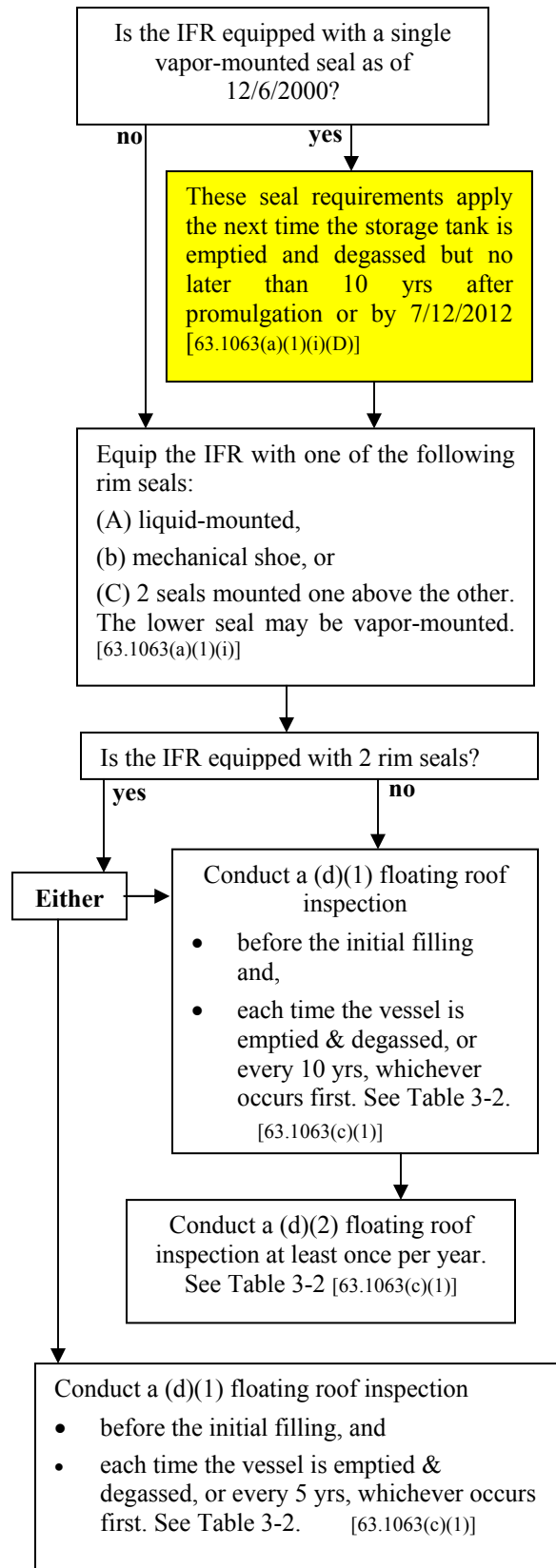
Records of vessel dimensions, inspections and operation are required. See Tables 11-3 and 4 in Chapter 11 of this manual for specific requirements.

**3.13 Reporting (§63.1066)**

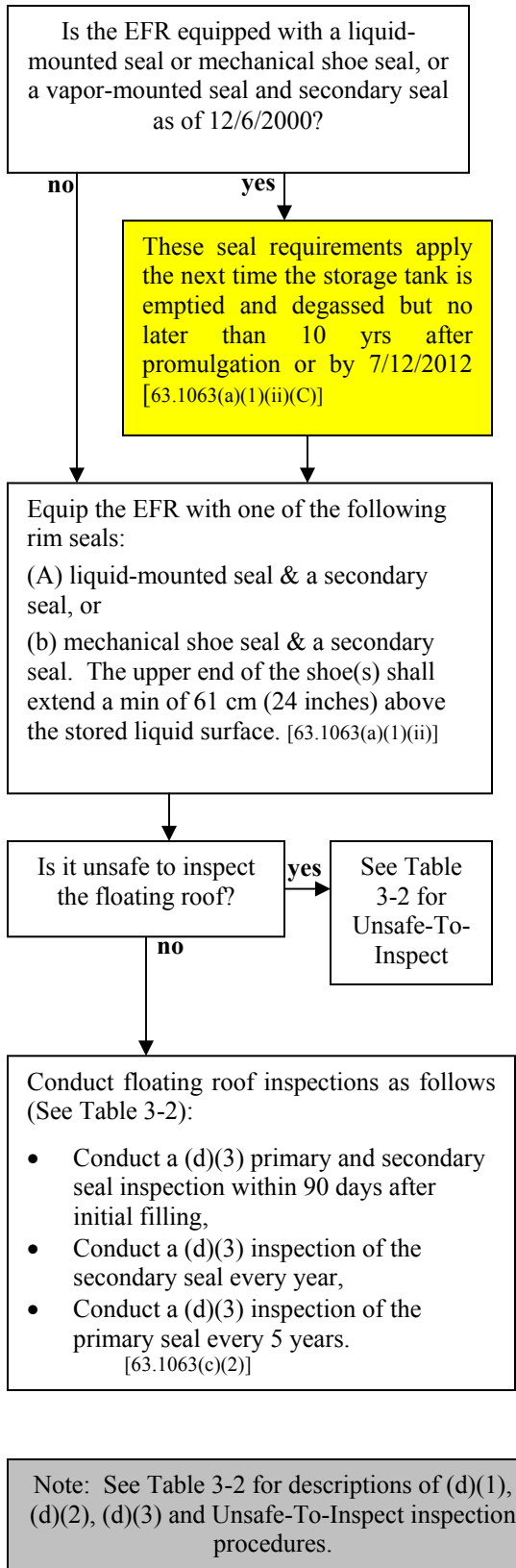
Initial Notice of Compliance Status (NOCS): As indicated in Table 12-14 in Chapter 12 of this manual specific information on floating roof storage vessels is not required to be included in the NOCS.

Periodic Reports: Notifications of inspections and inspection results are required. See Table 12-4 in Chapter 12 of this manual for specific requirements.

**Figure 3-3 IFR Design & Inspection Schedules**



**Figure 3-4 EFR  
Design & Inspection Schedules**



**Table 3-1**  
**Floating Roof Deck Fittings**  
**§63.1063(a)(2)**

(i) Each opening except those for automatic bleeder vents (vacuum breaker vents) and rim space vents shall have its lower edge below the surface of the stored liquid.
(ii) Each opening except those for automatic bleeder vents (vacuum breaker vents), rim space vents, leg sleeves, and deck drains shall be equipped with a deck cover. The deck cover shall be equipped with a gasket between the cover and the deck.
(iii) Each automatic bleeder vent (vacuum breaker vent) and rim space vent shall be equipped with a gasketed lid, pallet, flapper, or other closure device.
(iv) Each opening for a fixed roof support column may be equipped with a flexible fabric sleeve seal instead of a deck cover.
(v) Each opening for a sample well or deck drain (that empties into the stored liquid) may be equipped with a slit fabric seal or similar device that covers at least 90 percent of the opening, instead of a deck cover.
(vi) Each cover on access hatches and gauge float wells shall be designed to be bolted or fastened when closed.
(vii) Each opening for an unslotted guidepole shall be equipped with a pole wiper, and each unslotted guidepole shall be equipped with a gasketed cap on the top of the guidepole.
(viii) Each opening for a slotted guidepole shall be equipped with one of the control device configurations specified in paragraphs (a)(2)(viii)(A) and (a)(2)(viii)(B) of this section. (A) A pole wiper and a pole float. The wiper or seal of the pole float shall be at or above the height of the pole wiper. (B) A pole wiper and a pole sleeve.
(ix) If the floating roof does not meet the requirements listed in paragraphs (a)(2)(i) through (a)(2)(viii) of this section as of the proposal date of the referencing subpart, these requirements do not apply until the next time the vessel is completely emptied and degassed, or 10 years after the promulgation date of the referencing subpart, whichever occurs first.

**Table 3-2**  
**Floating Roof Inspection Procedures**  
 §63.1063(d)

<b>(d)(1) Floating Roof Inspections</b>
(d)(1) Floating roof (IFR and EFR) inspections shall be conducted by visually inspecting the floating roof deck, deck fittings, and rim seals from within the storage vessel. The inspection may be performed entirely from the topside of the floating roof, as long as there is visual access to all deck components. Any of the conditions described in (i) through (v) below constitutes inspection failure.
(i) Stored liquid on the floating roof.
(ii) Holes or tears in the primary or secondary seal (if one is present).
(iii) Floating roof deck, deck fittings, or rim seals that are not functioning as designed.
(iv) Failure to comply with the operational requirements.
(v) Gaps of more than 0.32 centimeters ( 1/8 inch) between any deck fitting gasket, seal, or wiper (required by paragraph (a) of this section) and any surface that it is intended to seal.
<b>(d)(2) Tank-top inspections of IFR's</b>
(d)(2) Tank-top inspections of IFR's shall be conducted by visually inspecting the floating roof deck, deck fittings, and rim seal through openings in the fixed roof. Any of the conditions described in paragraphs (d)(1)(i) through (d)(1)(iv) of this section constitutes inspection failure. Identification of holes or tears in the rim seal is required only for the seal that is visible from the top of the storage vessel.
<b>(d)(3) Seal gap inspections for EFR's</b>
(d)(3) Seal gap inspections for EFR's shall determine the presence and size of gaps between the rim seals and the wall of the storage vessel by the procedures specified in paragraph (d)(3)(i) of this section. Any exceedance of the gap requirements specified in paragraphs (d)(3)(ii) and (d)(3)(iii) of this section constitutes inspection failure.
(i) Rim seals shall be measured for gaps at one or more levels while the EFR is floating, as specified in paragraphs (d)(3)(i)(A) through (d)(3)(i)(F) of this section.
(A) The inspector shall hold a 0.32 centimeter ( 1/8 inch) diameter probe vertically against the inside of the storage vessel wall, just above the rim seal, and attempt to slide the probe down between the seal and the vessel wall. Each location where the probe passes freely (without forcing or binding against the seal) between the seal and the vessel wall constitutes a gap.
(B) The length of each gap shall be determined by inserting the probe into the gap (vertically) and sliding the probe along the vessel wall in each direction as far as it will travel freely without binding between the seal and the vessel wall. The circumferential length along which the probe can move freely is the gap length.

**Table 3-2  
Floating Roof Inspection Procedures (Cont'd)**

(C) The maximum width of each gap shall be determined by inserting probes of various diameters between the seal and the vessel wall. The smallest probe diameter should be 0.32 centimeter, and larger probes should have diameters in increments of 0.32 centimeter. The diameter of the largest probe that can be inserted freely anywhere along the length of the gap is the maximum gap width.
(D) The average width of each gap shall be determined by averaging the minimum gap width (0.32 centimeter) and the maximum gap width.
(E) The area of a gap is the product of the gap length and average gap width.
(F) The ratio of accumulated area of rim seal gaps to storage vessel diameter shall be determined by adding the area of each gap, and dividing the sum by the nominal diameter of the storage vessel. This ratio shall be determined separately for primary and secondary rim seals.
(ii) The ratio of seal gap area to vessel diameter for the primary seal shall not exceed 212 square centimeters per meter of vessel diameter (10 square inches per foot of vessel diameter), and the maximum gap width shall not exceed 3.81 centimeters (1.5 inches).
63.1063(c)(2)(iv) Unsafe to Inspect EFR
If the owner or operator determines that it is unsafe to perform the floating roof inspections specified in (d)(3) within 90 days of initial filling, or unsafe to perform the annual secondary seal or 5-year primary seal inspection per (d)(3), then the owner or operator shall comply with the requirements below
(A) The inspections shall be performed no later than 30 days after the determination that the floating roof is unsafe.
(B) The storage vessel shall be removed from liquid service no later than 45 days after determining the floating roof is unsafe. If the vessel cannot be emptied within 45 days, the owner or operator may utilize up to two extensions of up to 30 additional days each. If the vessel cannot be emptied within 45 days, the owner or operator may utilize up to two extensions of up to 30 additional days each. Documentation of a decision to use an extension shall include an explanation of why it was unsafe to perform the inspection, documentation that alternative storage capacity is unavailable, and a schedule of actions that will ensure that the vessel will be emptied as soon as practical.

**Table 3-3**  
**Storage Tank Assignment to Process Unit (63.1100(e))**

<p><i>(e) Storage vessel ownership determination.</i> To determine the process unit to which a storage vessel shall belong, the owner or operator shall sequentially follow the procedures specified in paragraphs (e)(1) through (8) of this section, stopping as soon as the determination is made.</p>
<p>(1) If a storage vessel is already subject to another subpart of this part on the date of promulgation for an affected source under the Generic MACT, that storage vessel shall belong to the process unit subject to the other subpart.</p>
<p>(2) If a storage vessel is dedicated to a single process unit, the storage vessel shall belong to that process unit.</p>
<p>(3) If a storage vessel is shared among process units, then the storage vessel shall belong to that process unit located on the same plant site as the storage vessel that has the greatest input into or output from the storage vessel (i.e., the process unit has the predominant use of the storage vessel.)</p>
<p>(4) If predominant use cannot be determined for a storage vessel that is shared among process units and if only one of those process units is subject to this subpart the storage vessel shall belong to that process unit.</p>
<p>(5) If predominant use cannot be determined for a storage vessel that is shared among process units and if more than one of the process units are subject to standards under this subpart that have different primary products, then the owner or operator shall assign the storage vessel to any one of the process units sharing the storage vessel.</p>
<p>(6) If the predominant use of a storage vessel varies from year to year, then predominant use shall be determined based on the utilization that occurred during the year preceding the date of promulgation of standards for an affected source under this subpart or based on the expected utilization for the 5 years following the promulgation date of standards for an affected source under this subpart for existing affected sources, whichever is more representative of the expected operations for that storage vessel, and based on the expected utilization for the 5 years after initial startup for new affected sources. The determination of predominant use shall be reported in the Notification of Compliance Status Report required by §63.1110(a)(4). If the predominant use changes, the redetermination of predominant use shall be reported in the next Periodic Report.</p>
<p>(7) If the storage vessel begins receiving material from (or sending material to) another process unit; ceases to receive material from (or send material to) a process unit; or if the applicability of this subpart to a storage vessel has been determined according to the provisions of paragraphs (e)(1) through (6) of this section and there is a significant change in the use of the storage vessel that could reasonably change the predominant use, the owner or operator shall reevaluate the applicability of this subpart to the storage vessel.</p>

**Table 3-3**  
**Storage Tank Assignment to Process Unit**  
**(Cont'd)**

(8) Where a storage vessel is located at a major source that includes one or more process units that place material into, or receive materials from, the storage vessel, but the storage vessel is located in a tank farm, the applicability of this subpart shall be determined according to the provisions in paragraphs (e)(8)(i) through (iii) of this section.

(i) The storage vessel may only be assigned to a process unit that utilizes the storage vessel and does not have an intervening storage vessel for that product (or raw material, as appropriate). With respect to any process unit, an intervening storage vessel means a storage vessel connected by hard-piping to the process unit and to the storage vessel in the tank farm so that product or raw material entering or leaving the process unit flows into (or from) the intervening storage vessel and does not flow directly into (or from) the storage vessel in the tank farm.

(ii) If there is only one process unit at a major source that meets the criteria of paragraph (e)(8)(i) of this section with respect to a storage vessel, the storage vessel shall be assigned to that process unit.

(iii) If there are two or more process units at the major source that meet the criteria of paragraph (e)(8)(i) of this section with respect to a storage vessel, the storage vessel shall be assigned to one of those process units according to the provisions of paragraph (e)(6) of this section. The predominant use shall be determined among only those process units that meet the criteria of paragraph (e)(8)(i) of this section.

# Ethylene MACT Compliance Manual

## Chapter 4

### Process Vents

#### Chapter 4 Index

- 4.1** *Overview*
- 4.2** *Structure of the Rule*
- 4.3** *Process Vent Definition and Applicability*
- 4.4** *Process Vent Assessment*
- 4.5** *Process Vent Control Requirements*
- 4.6** *Startup, Shutdown and Malfunction Provisions*
- 4.7** *Recordkeeping*
- 4.9** *Reporting*

#### 4.1 Overview

Part 63 Subpart YY contains provisions that apply to ethylene process vents. Ethylene process vents are defined in that subpart. Streams routed to fuel gas systems are not process vents under this regulation. The subpart includes procedures for evaluating ethylene process vents to determine if control is required. For vents requiring control, the Appendix D organic HAP content must be reduced by 98% or to below 20 ppmv Appendix D organic HAP or TOC, whichever is less stringent. Emissions must be vented through a closed vent system (CVS) to any combination of control devices (CD), including to a flare. CVS and CD used to accomplish the required reductions must meet the requirements spelled out in Subpart SS of Part 63 (See Chapter 9).

#### 4.2 Structure of the Rule

Subpart YY, the Generic MACT standard, defines ethylene process vents and the requirements that apply to those vents in §63.1103(e). Table 7 of §63.1103(e) lists the required emissions reduction or control efficiency. §63.1104 of Subpart YY specifies the applicability determination procedures that must be used to determine which individual ethylene process vents must be controlled. Requirements for the controls themselves are contained in Subpart SS of Part 63 and are summarized in Chapter 9 of this document. Startup, shutdown and malfunction provisions, which apply to process vents, including furnace and decoking vents, are contained in §63.1111 (see Chapter 10).

#### 4.3 Process Vent Definition and Applicability

An ethylene process vent is a gas stream with a flow rate >0.005 standard cubic meters per minute (0.177 standard cubic feet per minute) containing >20 ppmv Appendix D HAP that is continuously discharged during operation of an ethylene production unit. Ethylene process vents are gas streams that are discharged to the atmosphere (or the point of entry into a control device, if any) either directly or after passing through one or more recovery devices.

#### Exceptions:

Ethylene process vents do not include:

- Relief valve discharges;
- Gaseous streams routed to a fuel gas system;
- Leaks from equipment regulated under Subpart YY;



- Episodic or nonroutine releases such as those associated with SS&M; and
- In situ sampling systems (online analyzers).

NOTE: §63.1103(e)(1)(ii)(J) specifies that ethylene furnace emissions, including decoking emissions, are part of the ethylene production source category, but are not subject to any requirements from §63.1103(e)(3). Thus, only the SS&M provisions apply to these vents (see Chapter 10).

NOTE: §63.1104 contains procedures for handling process vents which become subject to control because of process changes. While §63.1104 is silent on the timetable for compliance in such cases, EPA staff indicate that they read §63.1102 and 63.1103 to require compliance with Group 1 requirements on startup of the process change.

Overlap with other Process Vent Regulations: (§63.1100(g)(2))

- A process vent that must be controlled according to the requirements of Ethylene MACT and Subpart III, NNN or RRR of Part 60 is required to comply only with the process vent requirements of Ethylene MACT.

NOTE: Since streams to fuel gas are excluded from the process vent definition in EMACT, but are not excluded under Subpart III, NNN or RRR, Ethylene MACT would not supersede for such streams.

**4.4 Process Vent Assessment (§63.1104)**

To determine which ethylene process vents must be controlled, an owner or operator must perform the applicability assessment procedures and methods for process vents specified in §63.1104, except for paragraphs (d), (g), (h), (i), (j), (l)(1), and (n).

Exception to assessment requirement:

Per §63.1104(a), an assessment is not required if the owner/operator opts to control the ethylene process vent and meets the control requirements of Subpart YY or Ethylene

MACT as specified in Table 7 of §63.1103(e) (see 4.5).

The ethylene process vent must be sampled at the exit from the unit operation before any control device. Method 1 or 1A of 40 CFR Part 60, appendix A, as appropriate, is used for selection of the sampling site. No traverse site selection method is needed for process vents smaller than 0.10 meter (0.33 foot) in nominal inside diameter. Determinations are to be made during maximum representative operating conditions.

TOC or organic HAP must be determined using Method 18, Method 25A, methods validated using Method 301 or an engineering assessment meeting the requirements of §63.1104(k).

§63.1104(e)(1) includes specific requirements associated with the use of Method 18 for these assessments. §63.1104(e)(2) includes specific requirements associated with the use of Method 25A for these assessments. The details of these paragraphs are not included here, but should be consulted if either of these Methods is to be used.

Per §63.1104(f), volumetric flowrate (standard cubic meters per minute at 20 °C) must be determined using Method 2, 2A, 2C, 2D, 2F, or 2G of 40 CFR Part 60, appendix A, as appropriate or the engineering assessment procedures specified in §63.1104(k). If the process vent passes through a final steam jet ejector and is not condensed, the stream volumetric flow shall be corrected to 2.3 percent moisture.

If engineering assessments are used, they must be performed for the representative operating conditions yielding the highest flowrate or concentration. Engineering assessment includes, but is not limited to:

- The maximum flow rate and/or Appendix D organic HAP concentration limit specified or implied within a permit limit applicable to the process vent.
- Use of previous test results, provided the tests are representative of current operating practices.

- Bench-scale or pilot-scale test data representative of the process under representative operating conditions.
- Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties. Examples of analytical methods include, but are not limited to (A) Use of material balances based on process stoichiometry to estimate maximum organic HAP concentrations, (B) Estimation of maximum flow rate based on physical equipment design such as pump or blower capacities, and (C) Estimation of organic HAP concentrations based on saturation conditions

**4.5 Process Vent Control Requirements**  
(§63.1103(e) Table 7)

Ethylene process vents meeting the requirements in Table 4-1 must be vented through a CVS to a CD such that Appendix D organic HAP is reduced by 98%, or TOC or HAP is reduced to less than 20 ppmv, whichever is less stringent or must be vented through a CVS to a flare meeting the requirements of §63.987.

**Table 4-1**  
**Ethylene Process Vent Control Triggers**

Source	Vent Flowrate (scmm/scfm)	Vent HAP Concentration (ppmv)
Existing	≥0.011/0.388	≥50
New	≥0.008/0.283	≥30

The CVS and CD must comply with the requirements specified in §63.982(b) or (c)(2). The compliance options specified in §63.982(b) and (c)(2) are:

- CVS to flare,
- CVS to nonflare CD.

Requirements for CVS and CD are discussed in Chapter 9 of this manual.

**4.6 Startup, Shutdown and Malfunction (SS&M) Provisions**

The process vent control requirements of §63.1103 do not apply during periods of SS&M. Instead compliance with the SSMP is required. Only SS&M requirements apply to decoke emissions.

SS&M and SSMP requirements are contained in §63.1111 of Subpart YY and are discussed in Chapter 10 of this manual.

**4.7 Recordkeeping**

Records must be maintained as specified in §63.1109 of Subpart YY and must be readily available for inspection. Most records must be maintained for 5 years. These requirements are discussed in Chapter 11.

Specific recordkeeping requirements associated with ethylene process vents are listed in the Tables included in Chapter 11.

**4.8 Reporting**

Specific notification and reporting requirements associated with process vents are included in Chapter 12.

# Ethylene MACT Compliance Manual

## Chapter 5

### Equipment Leaks

#### Chapter 5 Index

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#### 5.1 Overview

This rule applies to the control of air emissions from equipment leaks in ethylene processes. The rule contains requirements for inspection and monitoring of equipment, equipment design and operating provisions requirements for repair of leaking components and recordkeeping and reporting requirements.

#### 5.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in Table 7 of §63.1103(e) that ethylene processes must comply with the equipment leak detection and repair requirements in Subpart UU of Part 63 as made applicable by §63.1107.

Sections of Subpart UU are as follows:

- §63.1019 Applicability
- §63.1020 Definitions
- §63.1021 Alternative means of emission limitation
- §63.1022 Equipment identification
- §63.1023 Instrument and sensor monitoring for leaks
- §63.1024 Leak Repair
- §63.1025 Valves in gas/vapor/light liquid service
- §63.1026 Pumps in light liquid service
- §63.1027 Connectors in gas/vapor/light liquid service
- §63.1028 Agitators in gas/vapor/light liquid service
- §63.1029 Pumps, valves, connectors, and agitators in heavy liquid service; pressure relief devices in liquid service; and instrumentation systems
- §63.1030 Pressure Relief devices in gas/vapor service
- §63.1031 Compressors
- §63.1032 Sampling connection systems
- §63.1034 CVS and CD: or emissions routed to a fuel gas systems or process
- §63.1033 Open-ended valves or lines
- §63.1035 Quality improvement program for pumps

§63.1036 Alternate means of emission limitation: Batch processes

§63.1037 Alternative means of emission limitation: Enclosed-vented process units or affected facilities

§63.0138 Recordkeeping

§63.1039 Reporting

**5.3 Applicability** (§63.1019 and §63.1103)

The rule applies to the following equipment if the equipment contains or contacts a fluid that is at least 5 wt% of the organic HAP listed in Appendix D, on an annual average basis, and the equipment is not in vacuum service:

Pumps	Pressure relief devices
Compressors	Sampling connection systems
Agitators	Open-ended valves or lines
Valves	Instrumentation systems
Connectors	

The rule states that each piece of the above equipment that can reasonably be expected to contain Appendix D organic HAP is presumed to be in organic HAP service unless the owner/operator demonstrates that the organic HAP content can be reasonably not expected to exceed 5 wt % on an annual average basis. This demonstration can be made by testing (EPA Method 18) or by using good engineering judgment. If an owner or operator determines that a piece of equipment is in Appendix D organic HAP service, the determination can be revised by testing with Method 18, or by documenting that a change in the process or raw materials no longer causes the equipment to be in Appendix D organic HAP service. See §63.1107 for additional information.

The Ethylene MACT also applies to closed vent systems and control devices (such as flare systems) that are used to meet the requirements of the rule for routing equipment leaks through closed vent systems to a control device. Requirements for leak detection and repair of closed vent systems and for control devices are specified in Chapter 9 of this manual.

Exceptions:

- Equipment intended to be in Appendix D organic HAP service less than 300 hours/calendar year are excluded from the equipment leak standards (§63.1025 – §63.1034) but must be identified by list, location or other means per §63.1022(b)(5).
- Lines and equipment not containing process fluids, such as heating and cooling systems that do not combine their materials with the process are not subject to the equipment leak standards.

Overlap with other equipment leak requirements:

- Equipment that must be controlled according to Part 60 Subpart VV, or Part 61 Subpart J or V and these requirements for ethylene process units is required only to comply with these requirements.

NOTE: In the preamble to the EMACT amendments of April 2005, EPA clarified that Subpart UU may also be used in place of Subpart VV or Subparts J and V for equipment which is not in HAP service, by indicating that decision in the NOCS. [70 FR 19269, April 13, 2005]

**5.4 Definitions** (§63.1020, §63.1101 and §63.1103)

Although many of the definitions of terms in Ethylene MACT and Subpart WW are similar to those in most other equipment leaks rules, it is strongly recommended that persons who are accountable for design and implementation of the equipment leak compliance program carefully read the definitions provided in §63.1020 and §63.1103(e)(2) and which are compiled in Appendix A of this manual.

**5.5 Alternate Means of Emission Limitation** (§63.1021)

The rule provides that owners or operators of ethylene process units or manufacturers of equipment may submit requests to EPA for alternatives to the equipment standards of §63.1025 – §63.1034. Paragraph §63.1021 of Subpart WW defines this procedure.

**5.6 Equipment Identification** (§63.1022)

Equipment subject to Subpart WW must be identified. The equipment may be identified on a plant site plan, in log entries, by designation of process unit boundaries, by some form of weatherproof identification, or by other appropriate methods.

In addition, there are specific identification requirements in §63.1022(b)-(f) for the listed equipments types. These requirements are listed in Table 5-1 at the end of this chapter.

**5.7 Instrument and Sensory Monitoring for Leaks** (§63.1023)

Instrument monitoring for leaks: Instrument monitoring frequencies are shown in Table 5-2 at the end of this chapter.

- Instrument monitoring shall comply with EPA Method 21 of Part 60, Appendix A, except as provided in the Subpart UU. See Figures 5-2, 5-3 and 5-4 at the end of this chapter for a summary of Method 21 requirements.

An exception to Method 21 is that the instrument response factor criteria (maximum value 10) in Section 3.1.2, paragraph (a) of Method 21 shall be for the representative composition of the process fluid, not each individual VOC in the stream. For streams that contain inerts (nitrogen, air, water, etc.) the response factor shall be determined on an inert-free basis. The response factor can be determined at any concentration for which leaks will be monitored (for example at 500 ppm)

<p style="text-align: right;">Actual Concentration</p> $\text{Response Factor} = \frac{\text{Actual Concentration}}{\text{Measured Response}}$ <p>The response factor for a mixture is calculated from:</p> $\frac{1}{\text{RF}_{\text{MIX}}} = \text{SUM} \left( \frac{X_i}{\text{RF}_i} \right)_{i=1, \text{ to } n}$ <p>Where:  <math>\text{RF}_{\text{MIX}}</math> = Response factor of the mixture,  <math>X_i</math> = mol fraction of component i in the mixture,  <math>\text{RF}_i</math> = response factor for component i,  <math>n</math> = number of components in the mixture.</p> <p>As indicated above, <math>\text{RF}_i</math> can be for any concentration at which leaks will be monitored and data at 500 ppm is frequently available.</p>
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NOTE: The response factor described above is the EPA response factor, sometimes referred to as the “Response Factor Multiplier” and is defined as the ratio of the actual concentration to the measured instrument response. The reciprocal of the EPA response factor is referred to as the “Relative Response Factor.” Care should be taken in the selection of response factor data to assure that the correct format is used. Response factors for a number of substances are available from the instrument manufacturer’s literature.

NOTE: The response factor for a substance is dependent upon the instrument type. For example, the EPA response factor for 1,3-butadiene using the Foxboro TVA Photoionization Detection (PID) instrument is 1.07, but the value using the Foxboro Flame Ionization Detection (FID) instrument is 0.64, both determined at 500 ppm [TVA 1000 Response Factor Information, The Foxboro Company, February 1995].

- Daily calibration of the instrument is required.
- Calibration Gases:

Zero Air: < 10 ppm hydrocarbon in air

Standard Gas: Methane in air at no greater than 2,000 ppm above the leak definition

to be measured. If the instrument has two scales, calibrate the lower scale as above, and the upper scale at approximately 10,000 ppm. An alternate calibration gas can be used if the instrument does not meet the performance criteria using methane. For example, the instrument could be calibrated at 500 and 10,000 ppm, or at 2,000 and 10,000 when conducting monitoring for compliance with this rule in ethylene processes.

- Monitoring shall be performed when the equipment is in HAP service.
- Prior monitoring data may be used to qualify initially for less frequent monitoring schedules even if the data does not fully meet the above criteria. See §63.1023(b)(6) for details.
- Adjusting the instrument reading for background is optional (owner/operator's choice) in comparing the instrument reading to the leak definition.

Sensory monitoring methods consist of visual, audible, olfactory or any other detection method used to determine a potential leak.

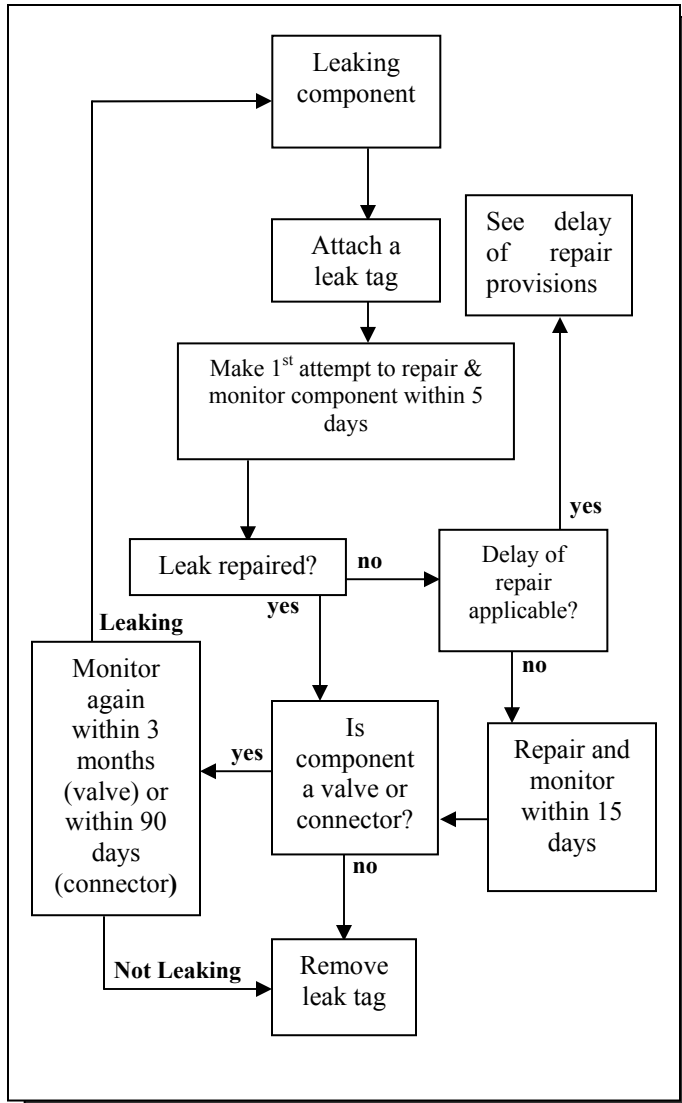
When each leak is detected, by instrument monitoring or sensory inspection, a weatherproof and readily visible identification shall be attached to the leaking equipment. Records of the leak are required (see Table 11-6)

**5.8 Leak Repair (§63.1024)**

Repair of leaks is required as soon as practical, but not later than 15 calendar days after it is detected, unless delay of repair is applicable. A first attempt to repair is required within 5 days. Unsafe-to-repair connectors are exempt from the 5 and 15 day requirements.

- Removal of “Leaker” tags. The leaker tag placed on a leaking valve or connector in gas/vapor or light liquid service can be removed after the leak is repaired (and has been monitored to confirm repair) and then remonitored at least one time within the following 3 months (for valves) or 90 days (for connectors), provided the valve or connector is not leaking at the time of the remonitoring. For other equipment, the leaker tag can be removed after the leak is repaired (and monitored to confirm repair).
- Delay of repair is allowed for the situations listed below.
  - Repair within 15 days is technically infeasible without a process unit or affected facility shutdown. Repair will occur as soon as practical but not later than the end of the next shutdown, except as provided below.
  - The equipment is isolated from service.

Figure 5-1 Leak Repair



- For pumps, repair requires replacing the existing seal design with a new systems that is determined under §63.1035(d) (the pump Quality Improvement Program) to be better performing or that is a compliant dual mechanical seal (see §63.1026(e)(1) or 5.10 of this manual), or a pump with no external shaft, or a system that routes pump seal emissions to a process or fuel gas system or a closed vent system and control device that meets §63.1026(e)(3), and repair is completed as soon as practical but not later than 6 months after the leak was detected.
- For valves, delay of repair beyond a shutdown will be allowed if valve assembly replacement is necessary and valve assembly supplies have been depleted and had been sufficiently stocked before the supplies were depleted. (See §63.1024(d)(5))

- For valves, connectors, and agitators, emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. When repair procedures are affected, the purged material is collected and destroyed, routed to fuel or process, or recovered in a compliant control device.
- Connectors designated unsafe-to-repair are exempt from the 5 and 15 day repair requirements.
- Records of leak repair attempts and leak repair delays are required. See Table 11-6.
- Reports are required for delay of repair. See Table 12-6.

**5.9 Valves in Gas/Vapor and in Light Liquid Service (§63.1025)**

Specific monitoring and repair schedules for valves in gas/vapor and in light liquid service are shown in Table 5-2 at the end of this chapter. As shown in the Table, monitoring frequency depends on the leak rate for the group of valves. The instrument reading that defines a leak is 500 ppm.

Subgrouping of valves:

Valves in a process unit or group of process units can be subgrouped for the purpose of determining monitoring frequencies. If this option is elected, the following rules apply:

- The overall leak rate for valves in the process unit, or group of process units, to be subgrouped must be less than 2%.
- Initially, valves with less than 1 year of monitoring data or valves not monitored within the last 12 months must be placed in the most frequently monitored subgroup until at least 1 year of monitoring date is obtained.
- Any valve can be reassigned to a more frequently monitored subgroup provided the valve was monitored in the most recent period of the less frequently monitored subgroup and the result included in the less frequently monitored subgroup's leak rate calculation.
- Any valve can be reassigned to a less frequently monitored subgroup provided the valve has not leaked for the period of the less frequently monitored subgroup. For example, a valve currently monitored quarterly could be moved to a subgroup monitored annually if the valve had not been found to be leaking during the last 12 months.

The overall leak rate of valves in subgroups shall be calculated every 6 months and reported in the semiannual reports. If the overall leak rate is 2% or greater, subgrouping of valves must be discontinued and leak rates and monitoring frequencies calculated on a process unit basis. Subgrouping can be elected again in the future if the overall leak rate for a process unit or group of process units is again less than 2% for a 6-month period.

- The overall leak rate (semiannual overall performance) for the total valves in a process unit or group of process units that are subgrouped or proposed to be subgrouped is calculated as follows:

$$\%V_{LO} = \frac{\text{Sum}(\%V_{Li} * V_i), i = 1, n}{\text{Sum}(V_i), i = 1, n}$$

where:

$\%V_{LO}$  = Overall leak rate of total valves

$V_{Li}$  = Percent leaking valves in subgroup i

$V_i$  = Number of valves in subgroup i

n = Number of subgroups

- Subgrouping records are required. See Table 11-6.
- Notification to EPA of the intent to start subgrouping is required 30 days prior to the beginning of the next monitoring period. See Table 12-24.
- The number of valves in each subgroup and the overall leak rate (semiannual overall performance) for the total valves in a process unit or group of process units are reported to EPA in the semiannual report. See Table 12-6 in Chapter 12 of this manual.



Percent leaking valves calculation:

The owner or operator shall decide no later than the compliance date (July 12, 2005 for existing units) or upon revision of an operating permit whether to calculate percent leaking valves on a process unit or group of process units basis. Once the owner or operator has decided, all subsequent percentage calculations shall be made on the same basis.

- The percent leaking valves for each monitoring period for each process unit or subgroup shall be calculated as follows:

$$\%V_L = \frac{100 * V_L}{V_T}$$

where:

$\%V_L$  = Percent leaking valves

$V_L$  = Number of valves leaking,

$V_T$  = The total number of valves monitored

In the above equation, the number of valves leaking includes nonrepairable valves found leaking during the current period. Nonrepairable valves found leaking in previous periods can be excluded from the % leak calculation, up to a maximum of 1% of the total number of valves in regulated service in the process unit or in the subgroup, if applicable.

Calculation of monitoring frequency:

When determining valve monitoring frequency for each process unit or group of valves,

- For monthly, quarterly, or semiannual frequencies, the percent leaking shall be the arithmetic average of the last two monitoring periods

- For monitoring annually or every two years, the percent leaking valves shall be the average of the last three monitoring periods.

Handling valves found leaking on remonitoring of repaired valves: When monitoring to satisfy the requirement to remonitor repaired valves within 3 months (§63.1025(d)(2):

- If scheduled periodic monitoring is used for this purpose, and the valve is found leaking, then that leak is included in the number of valves found leaking in the above equation.
- If other monitoring is used and the valve is found leaking, the leak is also counted in the above equation, unless the valve is repaired and shown to not be leaking by subsequent periodic monitoring.

**5.10 Pumps in Light Liquid Service**

(§63.1029)

Specific monitoring and repair schedules for pumps in light liquid service are shown in Table 5-2 at the end of this chapter.

For most pumps a leak is defined as an instrument reading  $\geq 1,000$  ppm. However, different leak definitions apply for pumps in food and polymerizing monomer service. See Table 5-2.

Percent Leaking Pumps Calculation:

The owner or operator shall decide no later than the compliance date (July 12, 2005 for existing units) or upon revision of an operating permit whether to calculate percent leaking pumps on a process unit basis or group of process units basis. Once the owner or operator has decided, all subsequent percentage calculations shall be made on the same basis.

The percent leaking pumps for each month is calculated as follows:

$$\%P_L = \frac{100 * (P_L - P_S)}{P_T - P_S}$$

where:

$\%P_L$  = % Pumps leaking

$P_L$  = Number of pumps found leaking as determined through monthly monitoring

$P_S$  = Number of pumps found leaking within 1 month of start-up

$P_T$  = Total number of pumps in regulated material service

In the above equation, all pumps in  $\geq 5$  wt% Appendix D organic HAP service are counted in the  $P_T$ , including pumps with dual mechanical seals, pumps with no external shaft, pumps with seal systems routed to a process or fuel gas system or equipped with a closed vent system, and unsafe to monitor pumps.

NOTE: If more than 90% of the pumps in a process unit are equipped with compliant dual mechanical seal systems or have no external shaft, then calculation of the percent leaking pumps for that unit is not required.

Pump Quality Improvement Program (QIP):

If, when calculated on a 6-month rolling average, at least the greater of either 10 percent of the pumps in a process unit or three pumps in a process unit leak, the owner or operator shall implement a quality improvement program for pumps that complies with the requirements of §63.1035 and is summarized in Section 5.19 of this chapter.

Dual mechanical seal pumps:

Pumps with dual mechanical seal systems that include a barrier fluid system are exempt from instrument monitoring requirements, as shown in Table 5-2, provided they meet the following:

- A criteria is determined and recorded that indicates a leak or seal system failure, based on both the appearance of drips at the pump and a seal system failure sensor. If the criteria are exceeded, the pump is leaking and repair is required, unless delay of repair is applicable.
- The seal system is one of the following three designs:
  - Operated with a barrier fluid that is at a pressure greater than the pump stuffing box pressure, or
  - Equipped with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a compliant control device, or
  - Equipped with a closed-loop system that purges the barrier fluid into a process stream.
- The barrier fluid is not a light liquid.
- The barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both. The sensor must be checked daily or equipped with an alarm.

**5.11 Connectors in Gas/Vapor Service and Light Liquid Service (§63.1027)**

Specific monitoring and repair schedules for connectors in gas/vapor and in light liquid service are shown in Table 5-2 at the end of this chapter. The instrument reading that determines a leak is 500 ppm.

Connectors are to be monitored one time during the first 12 months after the compliance date (July 12, 2006 for existing units). After this initial monitoring, the monitoring frequency for connectors in the process unit depends upon the leak rate, as shown in Table 5-2. If all connectors in the process unit have been monitored for leaks prior to the compliance date (July 12, 2005 for existing units), initial monitoring may not be required. See §63.1027(a).

Percent leaking connectors calculation:

For use in determining monitoring frequency, the percent leaking connectors shall be calculated as follow:

$$\%C_L = \frac{100 * C_L}{C_T}$$

where,

$\%C_L$  = Percent leaking connectors

$C_L$  = Number of connectors measured at 500 ppm or greater

$C_T$  = Total number of connectors monitored

**5.12 Agitators in Gas/Vapor Service and Light Liquid Service (§63.1028)**

Specific monitoring and repair schedules for agitators in gas/vapor and in light liquid service are shown in Table 5-2 at the end of this chapter. Requirements for agitators are very similar to the requirements for pumps. The main difference is that the leak definition for agitators is 10,000 ppm vs. the 1,000 ppm for standard service pumps.

Dual mechanical seal agitators:

Agitators with dual mechanical seal systems that include a barrier fluid system are exempt from monitoring requirements, as shown in Table 5-2, provided they meet the following:

- A criteria is determined and recorded that indicates a leak or seal system failure, based on both the appearance of drips at the agitator and a seal system failure sensor.
- The seal system is one of the following three designs:
  - Operated with a barrier fluid that is at a pressure greater than the agitator stuffing box pressure, or
  - Equipped with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a compliant control device, or

- Equipped with a closed-loop system that purges the barrier fluid into a process stream.
- The barrier fluid is not a light liquid.
- The barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both.

**5.13 Pumps, Valves, Connectors, and Agitators in Heavy Liquid Service; Pressure Relief Devices in Liquid Service; and Instrumentation Systems. (§63.1029)**

Heavy liquids are defined as liquid streams at process conditions that contain less than 20 wt% organic compound constituents that have vapor pressures greater than 0.3 kPa (2.25 mmHg) at 20°C. In ethylene process units, the fuel oil streams may typically be heavy liquid streams, since the most volatile components in these streams are usually C9 or C10 aromatics or cyclics with vapor pressure less than 0.3 kPa. The vapor pressures of some typical lower boiling components found in ethylene process fuel oil streams are shown below.

Isopropylbenzene	1.5 mm Hg @ 20 °C
Vinyltoluene	1.15 mm Hg at 20°C
Indene	1.1 mmHg @ 25 °C
Dicyclopentadiene	1.4 mmHg @ 20 °C
Naphthalene	0.08 mmHg @ 20 °C
Biphenyl	0.01 mmHg @ 25 °C

Instrumentation systems are defined in §63.1021. Generally, instrumentation systems consist of the equipment used to convey a sample of process fluid to analyzers or to instruments for the purpose of determining process conditions. However, valves greater than ½ inch nominal size and connectors greater than ¾ inch nominal size are not included in the definition of instrumentation systems.

The rule does not require scheduled monitoring or inspection for these systems. However there are requirements when evidence of a leak is observed by sensory or other means. See Table 5-2 at the end of this chapter.

#### 5.14 Pressure Relief Devices in Gas/Vapor Service (§63.1030)

Specific monitoring and repair schedules for pressure relief devices (PRDs) are shown in Table 5-2 at the end of this chapter.

The rule does not require scheduled monitoring or inspection. However the rule requires that the equipment be operated with an instrument reading (when monitored) of less than 500 ppm and that atmospheric PRDs be monitored within 5 days, if it releases. See Table 5-2.

#### 5.15 Compressor Standards (§63.1031)

Specific monitoring and repair schedules for compressors are shown in Table 5-2 at the end of this chapter.

##### Compressor seal requirements:

The rule requires that compressors comply with a seal system standard or with two other options. The seal system standard specifies a seal system that includes a barrier fluid and that prevents leakage of process fluid to the atmosphere. Seal system requirements are:

- The barrier fluid is equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.
- A criteria is determined and recorded that indicates a leak or seal system failure, based on the sensor.
- The seal system is one of the following three designs:
  - Operated with a barrier fluid that is at a pressure greater than the compressor stuffing box pressure, or
  - Equipped with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a compliant control device, or
  - Equipped with a closed-loop system that purges the barrier fluid into a process stream.
- The barrier fluid is not a light liquid.

##### Compressor seal systems alternatives:

As an option to the compressor seal system standard, compressors can comply with one of the following:

- Equip with a system that captures and transports leakage from the compressor drive shaft seal to a process or fuel gas system or equip with a closed vent system that captures and transports the leakage to a compliant control device.
- Comply with the alternative compressor standard, which requires that the compressor operate at all times with an instrument reading (when monitored by EPA Method 21) of less than 500 ppm.

#### 5.16 Sampling Connection Systems (§63.1032)

Sampling connection systems are process equipment (usually valves and connectors) that are used during periods of representative operation to take samples of the process fluid. The sample system requirements apply to all such systems in Appendix D organic HAP service, regardless of vapor pressure (i.e. gases, light liquids and heavy liquids). Equipment used to take non-routine grab samples is not considered a sampling connection system. Gasses displaced during filling of the sample container are not required to be collected or captured. In-situ sampling systems and sampling systems without purges are exempt from these requirements.

##### Sampling system equipment requirements:

Each sampling connection system must be equipped with one of the following, which are intended to capture the purge fluid:

- Closed-purge system, or
- Closed-loop system, or
- Closed vent system.

These systems shall be designed to capture and transport all the purged process fluid to:

- a process line or to a fuel gas system, or
- a compliant control device, or

- a compliant waste management unit (see §63.1032(c)(4)).

Containers that are part of a closed purge system must be covered or closed when not being filled or emptied.

#### **5.17 Open-ended Valves or Lines** (§63.1033)

Open-ended valves or lines shall be equipped with one of the following:

- Cap, or
- Blind flange, or
- A second valve. When a second valve is used, the valve closest to the process will be closed first (before the second valve).

When a double block and bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with the requirements to cap, blind flange or install a second valve at all other times.

Emergency shutdown systems that open automatically in the event of an upset are exempt from the requirements to cap, blind flange or install a second valve.

Open-ended valves or lines containing materials that would autocatalytically polymerize or would present an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block are exempt from these requirements.

#### **5.18 Closed Vent Systems and Control Devices; Emissions Routed to a Fuel Gas System or Process** (§63.1034)

Equipment leaks from pressure relief devices, dual mechanical seal systems on pumps, compressors and agitators, and from other equipment are sometimes routed back to process, to fuel gas systems, or by closed vent systems to a control device as a means of complying with the equipment leak requirements of Ethylene MACT. In these cases, there are additional provisions that are applicable and compliance with Part 63 Subpart SS is required.

Nonflare control devices must be designed and operated to reduce emissions of Appendix D organic HAP vented to them with an efficiency of 95 percent or greater, or to an exit concentration of 20 parts per million by volume, whichever is less stringent.

Enclosed combustion devices must be designed and operated to reduce emissions of Appendix D organic HAP vented to them with an efficiency of 95 percent or greater, or to an exit concentration of 20 parts per million by volume, on a dry basis, corrected to 3 percent oxygen, whichever is less stringent, or to provide a minimum residence time of 0.50 seconds at a minimum temperature of 760°C (1400°F).

The requirements of Subpart SS applicable to equipment leaks are described in Chapter 9 of this manual.

#### **5.19 Quality Improvement Program for Pumps.** (§63.1035)

Triggering the quality improvement program:

As indicated in Section 5.10 of this chapter, on a 6-month rolling average, if the greater of

- a) 10% or more of the pumps in a process unit or affected facility (or plant site) or
- b) three pumps are leaking,

then the owner or operator shall comply with the quality improvement program (QIP) for pumps.

After the QIP program is triggered, the program is exited when the pump 6-month rolling average leak rate is less than 10% or less than 3 pumps are leaking on a 6-month average basis. The QIP program would be again triggered if the 6-month leak rate exceeds these limits.

Contents of the QIP program

The QIP program for pumps includes (partial list)

- Data collection for each pump,
- Pump or pump seal inspection,
- Data analysis,
- Determination of superior pump or pump seal performance,
- A trial evaluation program,
- Performance trials,
- Quality assurance program,
- Pump or pump seal replacement, and
- Recordkeeping

Detailed Requirements of the QIP for pumps

The quality improvement program for pumps includes extensive and detailed requirements. Facilities that trigger this requirement or that are approaching leak rates that could trigger the pump QIP should carefully read the provisions in §63.1035.

**5.20 Alternate Means of Emissions  
Limitation: Batch Processes** (§63.1036)

Subpart UU includes an alternate to Method 21 monitoring that allows use of a pressure test. This alternative is applicable only to batch processes. (Processes in which the equipment is fed intermittently or discontinuously and which is typically emptied after processing the feeds)

Since ethylene production does not typically include batch processes, these requirements are not included in this manual. If there is interest in the provisions, refer to §63.1036.

**5.21 Alternate Means of Emissions  
Limitation: Enclosed-vented Processes**  
(§63.1037)

This alternative provides that process units or affected facilities or portions of process units at affected facilities enclosed in such a manner that all emissions from equipment leaks are vented through a closed vent system to a control device or routed to a fuel gas system or process meeting the requirements of §63.1034 are exempt from the other requirements of Subpart UU. The enclosure must be maintained under a negative pressure at all times while the process unit or affected facility is in operation to ensure that all emissions are routed to a control device. If there is interest in this alternative, refer to §63.037.

**5.22 Recordkeeping** (§63.1038)

An owner or operator of more than one source may comply with the equipment leak recordkeeping requirements in one recordkeeping system. The recordkeeping system shall identify each record by regulated source and the type of program being implemented (e.g., quarterly monitoring, quality improvement) for each type of equipment

Specific equipment leak recordkeeping requirements are listed in Table 11-6 in Chapter 11 of this manual.

**5.23 Reporting** (§63.1039)

Initial Compliance Status Report:

An initial compliance status report is required. Required items for the report and the reporting schedule are listed in Table 12-16 in Chapter 12 of this manual.

Semiannual Report:

Semiannual reports are required. Specific items for the reports and the reporting schedule are listed in Table 12-6 of Chapter 12 of this manual.

<b>Table 5-1</b>	
<b>Special Equipment Identification and Designations</b>	
<b>§63.1022(b) Additional Equipment Identification.</b>	
(1) <b>Connectors.</b> Except for inaccessible, ceramic, or ceramic-lined connectors and individual components in an instrumentation system, identify the connectors subject to the requirements of this subpart.	Connectors need not be individually identified if all connectors in a designated area or length of pipe subject to the provisions of this subpart are identified as a group, and the number of connectors subject is indicated. With respect to connectors, the identification shall be complete no later than the completion of the initial survey required by [§63.1022(a)].
(2) <b>Routed to a process or fuel gas system or equipped with a closed vent system and control device.</b>	Identify the equipment that the owner or operator elects to route to a process or fuel gas system or equip with a closed vent system and control device, under the provisions of §63.1026(e)(3) (pumps in light liquid service), §63.1028(e)(3) (agitators), §63.1030(d) (pressure relief devices in gas and vapor service), and §63.1031(e) (compressors).
(3) <b>Pressure relief devices.</b>	Identify the pressure relief devices equipped with rupture disks, under the provisions of §63.1030(e).
(4) <b>Instrumentation systems.</b>	Identify instrumentation systems subject to the provisions of §63.1029 of this subpart. Individual components in an instrumentation system need not be identified.
(5) <b>Equipment in service less than 300 hours per calendar year.</b>	The identity, either by list, location (area or group), or other method, of equipment in regulated material service less than 300 hours per calendar year within a process unit or affected facilities subject to the provisions of this subpart shall be recorded.
<b>§63.1022(c) Special equipment designations: Equipment that is unsafe or difficult-to-monitor.</b>	
(1) <b>Designation and criteria for unsafe-to-monitor.</b>	Valves meeting the provisions of §63.1025(e)(1), pumps meeting the provisions of §63.1026(e)(6), connectors meeting the provisions of §63.1027(e)(1), and agitators meeting the provisions of §63.1028(e)(7) may be designated unsafe-to-monitor if the owner or operator determines that monitoring personnel would be exposed to an immediate danger as a consequence of complying with the monitoring requirements of this subpart. Examples of unsafe-to-monitor equipment include, but is not limited to, equipment under extreme pressure or heat.

<b>Table 5-1 (Continued)</b>	
<b>Special Equipment Identification &amp; Designations</b>	
<b>(2) Designation and criteria for difficult-to-monitor.</b>	Valves meeting the provisions of §63.1025(e)(2) may be designated difficult-to-monitor if the provisions of paragraph (c)(2)(i) apply. Agitators meeting the provisions of §63.1028(e)(5) may be designated difficult-to-monitor if the provisions of paragraph (c)(2)(ii) apply.
	(i) <i>Valves.</i> (A) The owner or operator of the valve determines that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters (7 feet) above a support surface or it is not accessible in a safe manner when it is in regulated material service; and
	(B) The process unit or affected facility within which the valve is located is an existing source, or the owner or operator designates less than 3 percent of the total number of valves in a new source as difficult-to-monitor.
<b>(ii) Agitators.</b>	The owner or operator determines that the agitator cannot be monitored without elevating the monitoring personnel more than 2 meters (7 feet) above a support surface or it is not accessible in a safe manner when it is in regulated material service.
<b>(3) Identification of unsafe or difficult-to-monitor equipment.</b>	The owner or operator shall record the identity of equipment designated as unsafe-to-monitor according to the provisions of paragraph (c)(1) of this section and the planned schedule for monitoring this equipment. The owner or operator shall record the identity of equipment designated as difficult-to-monitor according to the provisions of paragraph (c)(2) of this section, the planned schedule for monitoring this equipment, and an explanation why the equipment is unsafe or difficult-to-monitor. This record must be kept at the plant and be available for review by an inspector.
<b>(4) Written plan requirements.</b>	(i) The owner or operator of equipment designated as unsafe-to-monitor according to the provisions of paragraph (c)(1) of this section shall have a written plan that requires monitoring of the equipment as frequently as practical during safe-to-monitor times, but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in §63.1024 if a leak is detected.
	(ii) The owner or operator of equipment designated as difficult-to-monitor according to the provisions of paragraph (c)(2) of this section shall have a written plan that requires monitoring of the equipment at least once per calendar year and repair of the equipment according to the procedures in §63.1024 if a leak is detected.



<b>Table 5-1 (Continued)</b>	
<b>Special Equipment Identification &amp; Designations</b>	
<b>§63.1022(d) <i>Special equipment designations: Equipment that is unsafe-to-repair.</i></b>	
(1) <i>Designation and criteria.</i>	Connectors subject to the provisions of §63.1024(e) may be designated unsafe-to-repair if the owner or operator determines that repair personnel would be exposed to an immediate danger as a consequence of complying with the repair requirements of this subpart, and if the connector will be repaired before the end of the next process unit or affected facility shutdown as specified in §63.1024(e)(2).
(2) <i>Identification of equipment.</i>	The identity of connectors designated as unsafe-to-repair and an explanation why the connector is unsafe-to-repair shall be recorded
<b>§63.1022(e) <i>Special equipment designations: Compressors operating with an instrument reading of less than 500 parts per million above background.</i></b>	Identify the compressors that the owner or operator elects to designate as operating with an instrument reading of less than 500 parts per million above background, under the provisions of §63.1031(f).
<b>§63.1022(f) <i>Special equipment designations: Equipment in heavy liquid service.</i></b>	The owner or operator of equipment in heavy liquid service shall comply with the requirements of either paragraph (f)(1) or (f)(2) of this section, as provided in paragraph (f)(3) of this section.
	(1) Retain information, data, and analyses used to determine that a piece of equipment is in heavy liquid service.
	(2) When requested by the Administrator, demonstrate that the piece of equipment or process is in heavy liquid service.
	(3) A determination or demonstration that a piece of equipment or process is in heavy liquid service shall include an analysis or demonstration that the process fluids do not meet the definition of “in light liquid service.” Examples of information that could document this include, but are not limited to, records of chemicals purchased for the process, analyses of process stream composition, engineering calculations, or process knowledge.

**Table 5-2  
Equipment Monitoring and Repair Requirements  
(See Acronym list at end of Table)**

Item	Designation	Service	Leak Def.	Leak Rate or other Condition	Monitoring Frequency	1 <sup>st</sup> attempt days	Repair Days	Remonitor after repair	Visual Inspection	Check Sensor
Valve	A	G/V/L	500	2% or less	Monthly	5	15	3 months		
Valve	A	G/V/L	500	1% to <2%	Quarterly	5	15	3 months		
Valve	A	G/V/L	500	0.5% to <1%	Semiannually	5	15	3 months		
Valve	A	G/V/L	500	0.25% to <0.5%	1 time /yr	5	15	3 months		
Valve	A	G/V/L	500	<0.25%	Every 2 yrs	5	15	3 months		
Valve	UTM	G/V/L	500		As safe, per Plan	5	15			
Valve	DTM	G/V/L	500		1 time/yr, per Plan	5	15	3 months		
Valve	<250 <sup>1</sup>	G/VL	500	2% or less	Quarterly	5	15	3 months		
Pump	STD	L	1,000 <sup>2</sup>		Monthly	5	15		Weekly <sup>3</sup>	
Pump	DMS	L	1,000			5	15		Weekly <sup>4</sup>	Daily <sup>5</sup>
Pump	UTM	L	1,000 <sup>2</sup>		As safe, per Plan	5	15			
Pump	NES	L	1,000 <sup>2</sup>			5	15			
Pump	CVS	L	1,000 <sup>2</sup>			5	15			Pump

<sup>1</sup> A plant site with fewer than 250 valves in 5% or more Appendix D organic HAP service. Quarterly monitoring is allowed instead of monthly.

<sup>2</sup> Repair is not required unless the leak is 2,000 ppm or greater. Note that for pumps with dual mechanical seals, repair is required when a leak of 1,000 ppm or higher is detected. The leak definitions are 5,000 ppm for pumps handling polymerizing monomers, and 2,000 ppm for pumps in food/medical service.

<sup>3</sup> If there are indications of liquids dripping, the pump shall be monitored to determine if a leak exists and then make repairs if needed. The owner or operator shall eliminate the visual indications of liquids dripping. At an unmanned plant site, inspect as often as practical, at least monthly.

<sup>4</sup> If there are indications of liquids dripping, the pump shall be monitored to determine in a leak exists. If a reading or 1,000 ppm is obtained a leak is detected and repair is required. The owner or operator shall eliminate the visual indications of liquids dripping. At an unmanned plant site, inspect as often as practical, at least monthly.

<sup>5</sup> Check sensor daily or equip with an alarm

Table 5-2 (Continued) Equipment Monitoring and Repair Requirements										
Item	Designation	Service	Leak Def.	Leak Rate or other Condition	Monitoring Frequency	1 <sup>st</sup> attempt days	Repair Days	Remonitor after repair	Visual Inspection	Check Sensor
CON	STD	G/V/L	500	Initial Period	1 time by 7/12/06	5	15	90 days		
CON	STD	G/V/L	500	0.5% or greater	1 time/year	5	15	90 days		
CON	STD	G/V/L	500	0.25% to <0.5%	1 time/4-years <sup>6</sup>	5	15	90 days		
CON	STD	G/V/L	500	<0.25%	50% within 4 years <sup>7</sup>	5	15	90 days		
CON	UTM	G/V/L	500	Any	As safe, per Plan	5	15			
CON	I <sup>8</sup>	G/V/L	500	Any					See Footnote <sup>9</sup>	
AG	STD	G/V/L	10,000		Monthly	5	15		Weekly <sup>10</sup>	
AG	DMS	G/V/L	10,000			5	15		Weekly <sup>10</sup>	Daily <sup>5</sup>
AG	NES	G/V/L	10,000			5	15			
AG	DTM	G/V/L	10,000		1 time/yr, per Plan	5	15			
AG	OBS	G/V/L	10,000			5	15			
AG	UTM	G/V/L	10,000			5	15			
Valve		HL	500			5	15		See footnote <sup>11</sup>	

<sup>6</sup> 40% of the connectors must be monitored in the first 2 years of the start of the monitoring period and all connectors monitored by the end of the 4-year period

<sup>7</sup> If the leak rate for connectors monitored in the first 4 years is 0.35% or more, monitor all remaining connectors as soon as practical, but within 6 months. If the leak rate for the first 4 years was less than 0.35%, monitor all remaining connectors within 8 years of the start of the monitoring period.

<sup>8</sup> Inaccessible includes buried, insulated, obstructed in a way that prevents monitoring, unable to be reached from a wheeled scissor-lift or hydraulic-type scaffold that would allow access up to 25 feet above ground, would require elevating personnel more than 7 feet above a permanent support surface, and not able to be accessed at any time in a safe manner.

<sup>9</sup> If observed to be leaking, the indications of the leak must be removed as soon as practical.

<sup>10</sup> If there are indications of liquids dripping, the agitator shall be monitored to determine if a leak exists and repairs made if leaking. The owner or operator shall eliminate the visual indications of liquids dripping. At an unmanned plant site, inspect as often as practical, at least monthly.

**Table 5-2 (Continued)**  
**Equipment Monitoring and Repair Requirements**

Item	Designation	Service	Leak Def.	Leak Rate or other Condition	Monitoring Frequency	1 <sup>st</sup> attempt days	Repair Days	Remonitor after repair	Visual Inspection	Check Sensor
Pump		HL	2,000 <sup>12</sup>			5	15		See footnote <sup>11</sup>	
CON		HL	500			5	15		See footnote <sup>11</sup>	
AG		HL	10,000			5	15		See footnote <sup>11</sup>	
PRD		L/HL	500			5	15		See footnote <sup>11</sup>	
IS		G/V/L/HL	500			5	15		See footnote <sup>11</sup>	
PRD	STD	G/V	500		See footnote <sup>13</sup>		5			
PRD	CVS									
PRD	RD <sup>14</sup>						5			
COMP	DMS	G/V	criteria <sup>15</sup>			5	15			daily <sup>16</sup>
COMP	CVS	G/V								
COMP	NDE	G/V	500		Initially & annually					

<sup>11</sup> Scheduled inspection is not required. Monitor within 5 calendar days if evidence of a potential leak is observed by visual, audible, olfactory or any other detection method. If the indications of the leak are eliminated as evidenced by eliminating the sensory indication, or by the use of a soap bubble test, or by a system pressure test, then monitoring is not required.

<sup>12</sup> 5000 ppm for pumps handling polymerizing monomers

<sup>13</sup> Monitor and return to 500 ppm as soon as practical, but within 5 days after a pressure release

<sup>14</sup> PRD equipped with a rupture disk upstream of the PRD. Failed RDs shall be replaced within 5 days

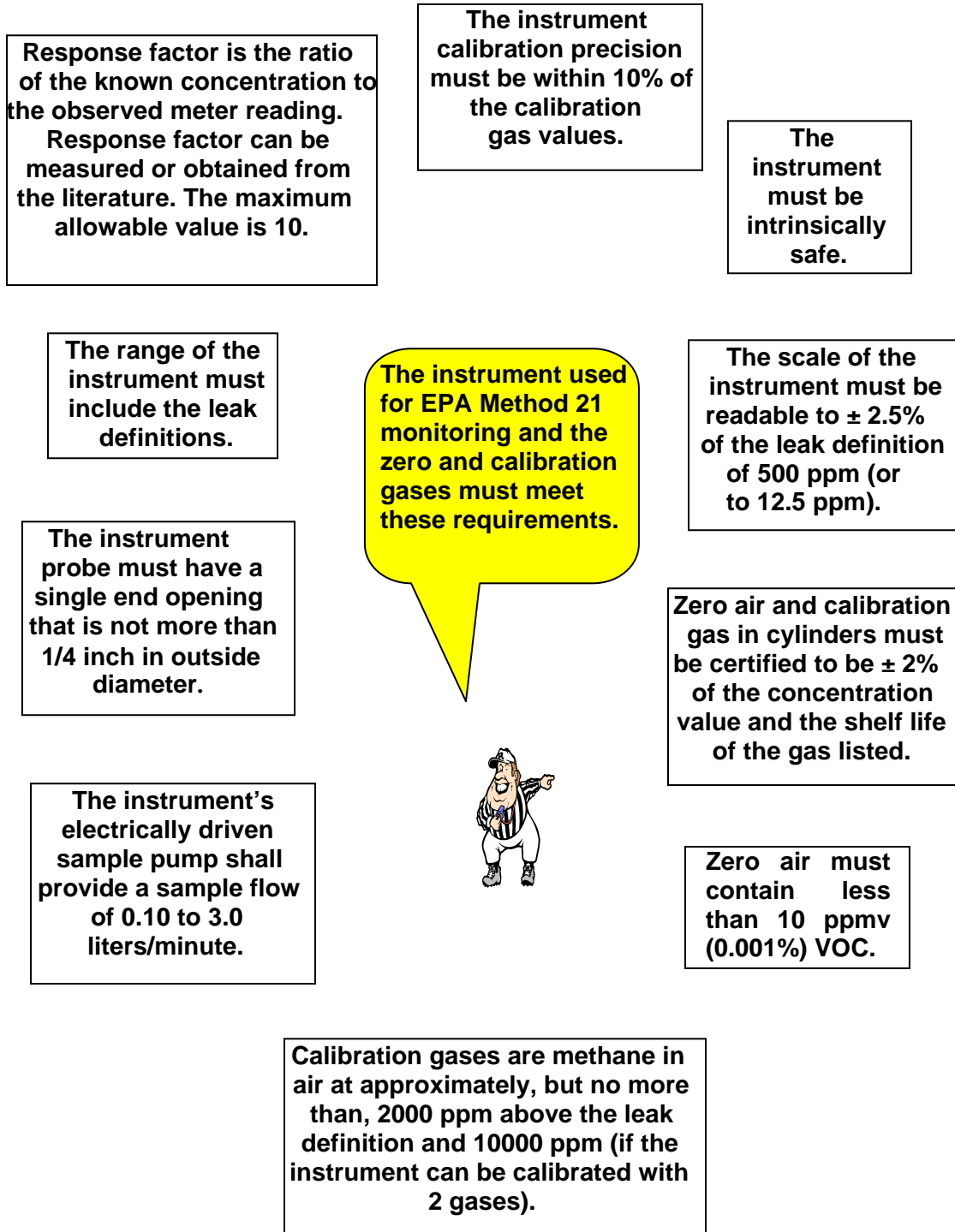
<sup>15</sup> The owner/operator determines criteria that indicate failure of the seal system, the barrier fluid system, or both.

<sup>16</sup> Check sensor daily or equip with an alarm.

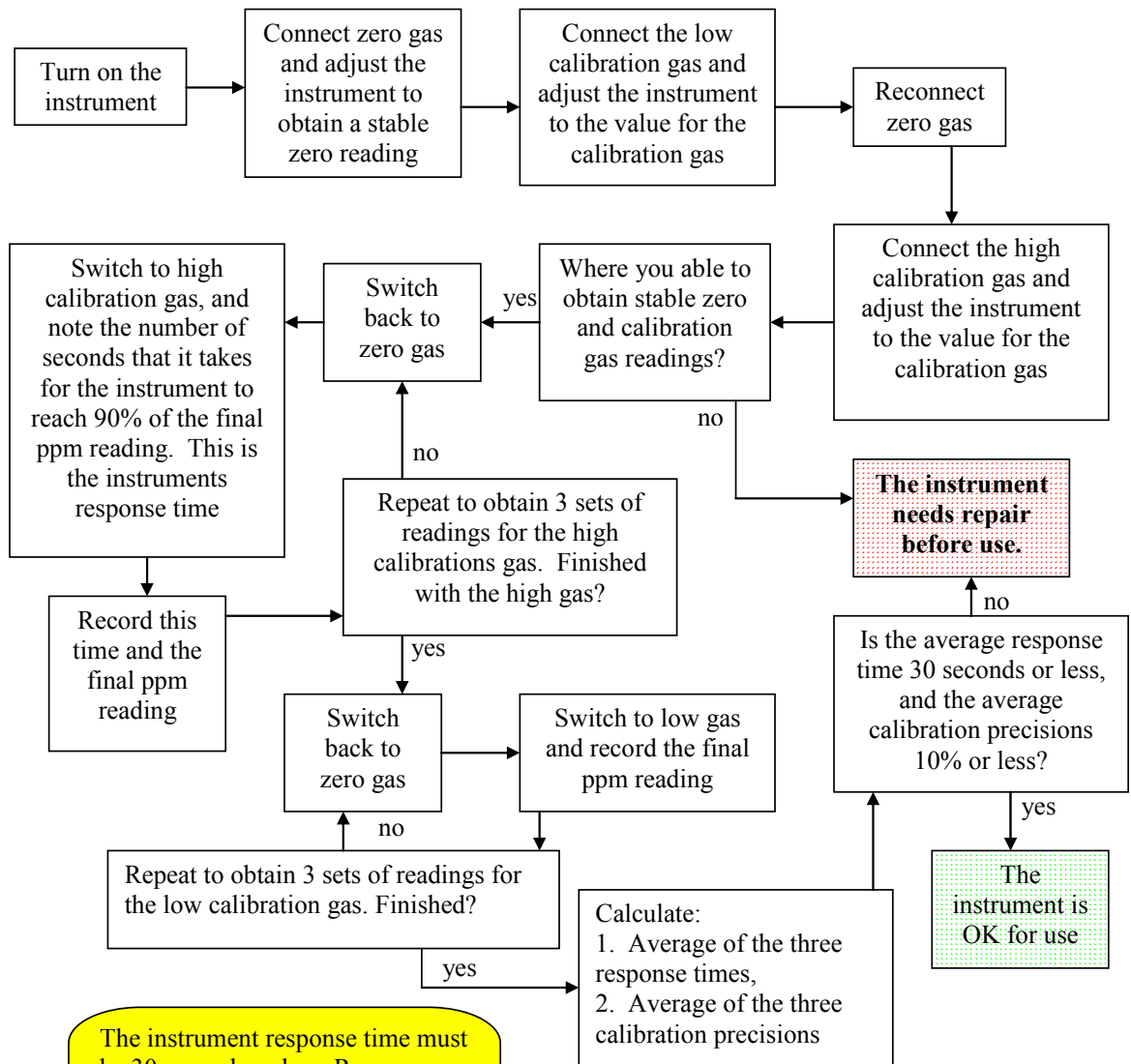
Acronyms used in Table 5-2

A=accessible	G=gas	OBS=obstructed
AG=agitator	HL=heavy liquid	PRD=pressure relief device
CON=connector	I=inaccessible, ceramic or ceramic-lined	RD=rupture disk
COMP=compressor	IS=instrumentation system	STD=standard (non-exempt)
CVS=equipped with closed vent system or routed to process or fuel system	L=light liquid	UTM=unsafe-to-monitor
DMS=double mechanical seal	NES=no external shaft	V=vapor
DTM=difficult-to-monitor	NDE=no detectable emissions (<500 ppm)	

Figure 5-2  
EPA Method 21 Instrument Requirements



**Figure 5-3  
EPA Method 21 Calibration**



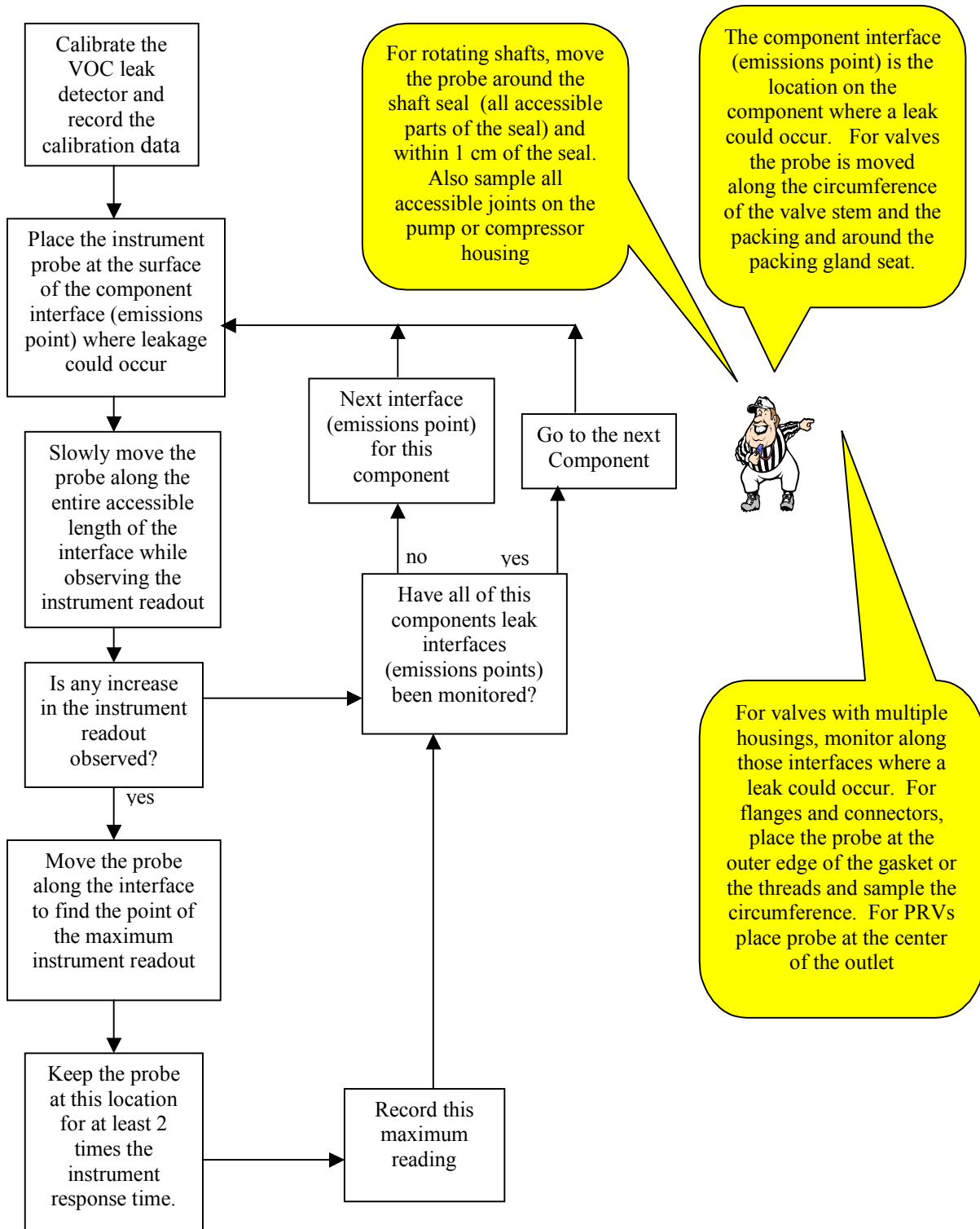
The instrument response time must be 30 seconds or less. Remeasure response time if the instrument probe or the pumping system are modified in a way that could change the response time.

Calibration precision is the difference between the measured and the calibration gas values, divided by the calibration value. It must be 10% or less.

This procedure is for an instrument that has two scales.



Figure 5-4  
EPA Method 21 Monitoring





# Ethylene MACT Compliance Manual

## Chapter 6

### Transfer Operations

#### Chapter 6 Index

<b>6.1</b>	<b><i>Overview</i></b>
<b>6.2</b>	<b><i>Structure of the Rule</i></b>
<b>6.3</b>	<b><i>Applicability</i></b>
<b>6.4</b>	<b><i>Definitions</i></b>
<b>6.5</b>	<b><i>Basic Requirements</i></b>
<b>6.6</b>	<b><i>Transfer Rack Provisions</i></b>
<b>6.7</b>	<b><i>Recordkeeping</i></b>
<b>6.8</b>	<b><i>Reporting</i></b>

#### 6.1 Overview

These requirements apply to loading Appendix D organic HAP-containing streams into tank trucks and tank cars at ethylene process units. The rule requires equipment to control vents from the loading operation, operation of the control equipment, and either documentation that tank cars or tank trucks have a current DOT test certification or documentation of vapor-tightness testing. Transfer racks that use vapor balance at all times when loading HAP-containing streams are exempt from these requirements.

#### 6.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in Table 7 of §63.1103(e), that ethylene processes must comply with the provisions of §63.1105 to control Appendix D organic HAP emissions from transfer operations.

#### 6.3 Applicability (§63.1103(e))

The rule applies to each transfer rack that loads materials

- with a true vapor pressure of total Appendix D organic HAP that is greater than or equal to 3.4 kPa (0.5 psia), and

- the amount of Appendix D organic HAP-containing material loaded is greater than or equal to 76 cubic meters/day (20,077 gallons/day), averaged over any consecutive 30-day period.

#### Exceptions:

The following transfer racks, loading arms, or loading hoses are not subject to these requirements:

- Those that only transfer liquids containing Appendix D organic HAP as impurities,
- Those that vapor balance during all transfer operations.

NOTE: These provisions apply to the loading of bulk cargo tanks mounted on trucks or railcars. It does not apply to unloading this equipment, or to the loading or unloading of marine equipment (barges and ships).

#### Overlap with other Transfer Operations Requirements:

- A transfer rack that must be controlled according to the requirements of Subpart BB (Benzene Transfer Operations) is required to comply with only these requirements.

#### 6.4 Definitions (§63.1101)

Definitions applicable to ethylene process transfer racks can be found in §63.1101 and §63.1103(e)(2) and are compiled in Appendix A of this manual. Two of these definitions are listed here.

- *Transfer rack* means a single system used to fill bulk cargo tanks mounted on or in a truck or railcar. A transfer rack includes all loading arms, pumps, meters, shutoff valves, relief valves, and other piping and equipment necessary for the transfer operation. Transfer equipment and operations that are physically separate

(i.e., do not share common piping, valves, and other equipment) are considered to be separate transfer racks.

- *Vapor balancing system* means a piping system that is designed to collect organic HAP vapors displaced from tank trucks or railcars during loading; and to route the collected organic HAP vapors to the storage vessel from which the liquid being loaded originated, or to compress collected organic HAP vapors and commingle with the raw feed of a production process unit.

### 6.5 Basic Requirements (§63.1103(e))

Owners or operators of transfer racks that load at least 76 M<sup>3</sup> (20,077 gal) of liquids per day that have a true vapor pressure of total Appendix D organic HAP that is greater than or equal to 3.4 kPa (0.5 psia) are subject to these transfer rack requirements and have two options for compliance:

- Reduce emissions of Appendix D organic HAP
  - by 98 wt%, or
  - reduce Appendix D organic HAP or TOC to 20 ppmv or less,whichever is less stringent, by venting emissions through a closed vent system to any combination of control devices as specified in §63.1105 (see 6.6 of this chapter); **or**
- Install process piping designed to collect the Appendix D organic HAP-containing vapors displaced from tank trucks or tank cars during loading and route the vapors to a process, a fuel gas system, or a vapor balance system, as specified in §63.1105 (see 6.6 of this chapter).

### 6.6 Transfer Rack Provisions (§63.1105)

Design Requirements: Each transfer rack shall be equipped with one of the following control options.

- (1) A closed vent system designed to collect HAP-containing vapors displaced from tank trucks or tank cars during loading and to route the collected vapors to a flare. The owner or operator must meet the requirements of §63.982(a)(3). See Chapter 9 for closed vent system and flare requirements.
- (2) A closed vent system designed to collect HAP-containing vapors displaced from tank trucks or railcars during loading and to route the collected vapors to a control device other than a flare. The owner or operator must meet the requirements of §63.982(a)(3). See Chapter 9 for closed vent system and control device requirements.
- (3) Process piping designed to collect the HAP vapors displaced from tank trucks or railcars during loading and to route the collected vapors to a process where the HAP vapors shall predominantly meet one of, or a combination of, the following or to a fuel gas system. The owner or operator must meet the requirements of §63.982(a)(3) (see Chapter 9 for those requirements).
  - (i) Recycled and/or consumed in the same manner as a material that fulfills the same function in that process;
  - (ii) Transformed by chemical reaction into materials that are not HAP;
  - (iii) Incorporated into a product; and/or
  - (iv) Recovered.
- (4) Process piping designed to collect the HAP vapors displaced from tank trucks or railcars during loading and to route the collected vapors to a vapor balance system. The vapor balance system must be designed to route the collected HAP vapors to the storage vessel from which the liquid being loaded originated, or to another storage vessel connected to a common header, or to compress and route collected HAP vapors to a process.

Operating Requirements: The transfer rack shall be operated so that the emissions are routed through the control equipment required above.

Control Devices: Control devices shall be operating whenever HAP emissions are vented to them.

Tank trucks and railcars: The owner or operator shall load HAP-containing materials only into tank trucks and railcars that:

(1) Have a current certification in accordance with the U.S. Department of Transportation (DOT) pressure test requirements of 49 CFR Part 180 for tank trucks and 49 CFR 173.31 for railcars; **or**

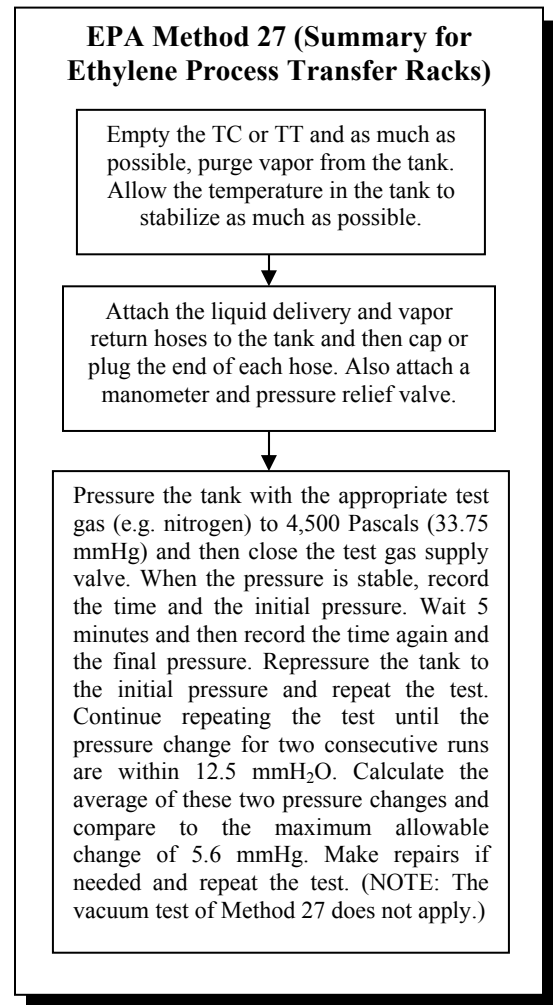
(2) Have been demonstrated to be vapor-tight within the preceding 12 months. Vapor-tight means that the pressure in a truck or railcar tank will not drop more than 750 pascals (5.6 mmHg) within 5 minutes after it is pressurized to a minimum of 4,500 pascals (33.75 mmHg). For the purposes of demonstrating vapor tightness, the following procedures and equipment shall be used:

- The pressure test procedures specified in Method 27 of appendix A to Part 60.
- A pressure measurement device that has a precision of ±2.5 millimeters of mercury or better and that is capable of measuring above the pressure at which the tank truck or railcar is to be tested for vapor tightness.

Pressure relief device: The owner or operator of a transfer rack subject to the provisions of Subpart YY shall ensure that no pressure relief device in the loading equipment of each tank truck or railcar shall begin to open to the atmosphere during loading. Pressure relief devices needed for safety purposes are not subject to the requirements of this paragraph.

Compatible system: The owner or operator of a transfer rack subject to the provisions of Subpart YY shall load Appendix D organic HAP-containing materials only into tank trucks or railcars equipped with a vapor collection system that is compatible with the transfer rack's closed vent system or process piping.

Loading while systems connected: The owner or operator of a transfer rack subject to Subpart YY shall load Appendix D organic HAP-containing material only into tank trucks or railcars whose collection systems are connected to the transfer rack's closed vent system or process piping.



**6.7 Recordkeeping (§63.1105(i))**

The owner or operator of a transfer rack subject to Ethylene MACT requirements shall record the verification of DOT tank certification or that Method 27 of appendix A to Part 60 testing has been performed. Various methods for the record of verification can be used, such as a check-off on a log sheet, a list of DOT serial numbers or Method 27 data, or a position description for gate security showing that the security guard will not allow any trucks on-site that do not have the appropriate documentation.

Refer to Chapter 11 Table 11-7 for details of transfer rack record requirements.

**6.8 Reporting**

Specific notification and reporting requirements associated with transfer operations are included in Chapter 12.

# Ethylene MACT Compliance Manual

## Chapter 7

### Waste Operations

#### Chapter 7 Index

- 7.1 *Overview*
- 7.2 *Structure of the Rule*
- 7.3 *Applicability and Requirements*
- 7.4 *Definitions*
- 7.5 *Major Differences between Subpart XX and BWON*
- 7.6 *Waste Requirements – Continuous Butadiene Wastes*
- 7.7 *Recordkeeping Requirements – Continuous Butadiene Wastes*
- 7.8 *Reporting Requirements – Continuous Butadiene Wastes*
- 7.9 *Waste Requirements – Benzene Wastes*
- 7.10 *Waste Requirements – Off Site Transfers*

#### 7.1 Overview

These provisions specify requirements for treatment of wastes, including wastewater at ethylene production units. The rule requires compliance with Part 61 Subpart FF (the Benzene Waste Operations NESHAP), or BWON, but with some important modifications, including the requirement to control certain butadiene-containing wastewater streams and new requirements for wastes sent offsite. Ethylene production units that are currently exempt from BWON controls under Part 61 Subpart FF because they are part of a facility that has a Total Annual Benzene (TAB) quantity less than 10 Mg/yr are not exempt from the requirements of Subpart XX for ethylene production units. Since most ethylene production units are already subject to the BWON, the discussion in this chapter focuses on the changes imposed by the Ethylene MACT. Other references should be consulted for an understanding of the details of BWON compliance.

#### 7.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in Table 7 of §63.1103(e), that ethylene processes must comply with the provisions of Part 63 Subpart XX to control Appendix D organic HAP emissions from applicable waste streams. Waste and wastewater requirements from Subpart XX are discussed in this chapter. Subpart XX requires compliance with the BWON and includes some additional provisions. The applicable sections of Subpart XX for wastes are:

§63.1080 What is the purpose of this subpart?

§63.1081 When must I comply with the requirements of this subpart?

§63.1082 What definitions do I need to know?

§63.1091 What do the waste requirements do?

§63.1092 What are the major differences between the requirements of 40 CFR Part 61, Subpart FF, and the waste requirements for ethylene production sources?

§63.1093 Does this subpart apply to my waste streams?

§63.1094 What waste streams are exempt from the requirements of this subpart?

§63.1095 What specific requirements must I comply with?

63.1096 What requirements must I comply with if I transfer waste off-site?

§63.1097 Who implements and enforces this subpart

Table 1 Hazardous Air Pollutants

Table 2 Requirements in 40 CFR Part 61, Subpart FF (BWON), not Applicable to or Replaced for Ethylene Production Units

**7.3 Applicability and Requirements**  
 (§63.1103(e))

Subpart XX applies to ethylene process units that generate wastes that contain any of the following organic HAP listed in Table 7-1. These are the Appendix D organic HAP referenced in this manual. See Section 7.4 for definitions of waste and waste streams.

**Table 7-1 Organic HAP**

benzene	naphthalene	m-xylene
cumene	styrene	p-xylene
ethylbenzene	toluene	o-xylene
hexane	1,3-butadiene	

Exceptions:

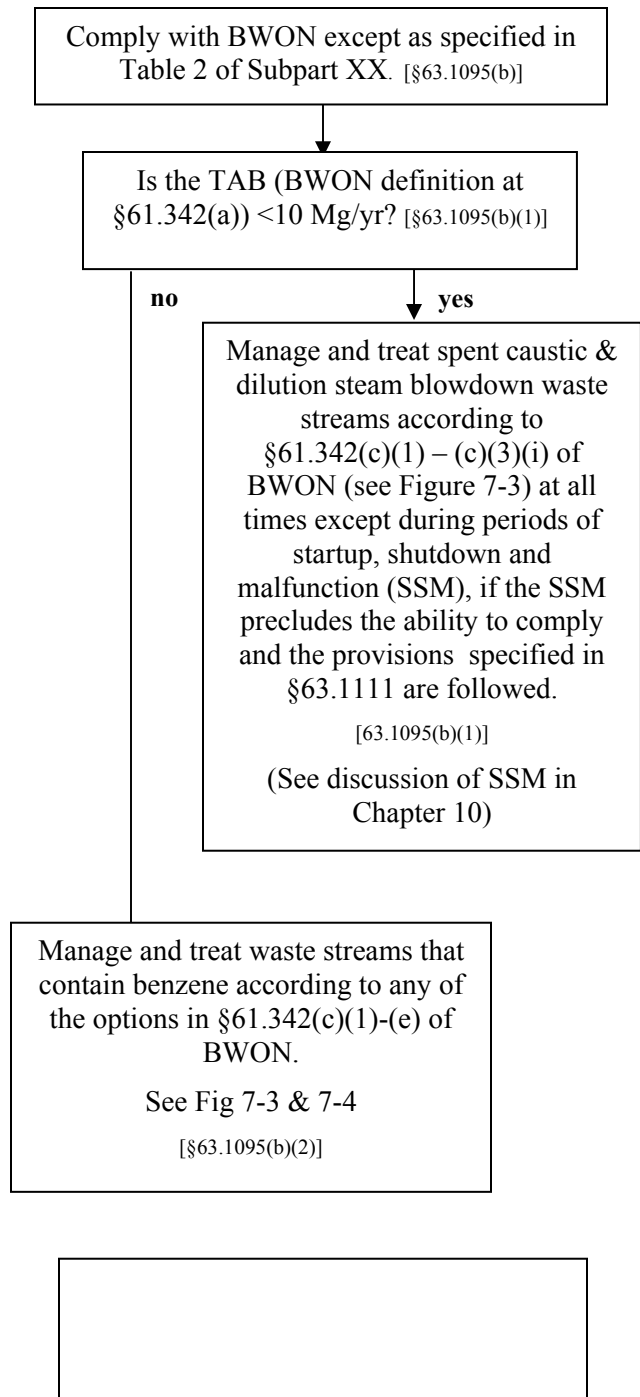
The waste and wastewater streams listed below are not subject to these requirements:

- Waste in the form of gases or vapors that is emitted from process fluids,
- Waste that is contained in a segregated storm water sewer system.
- Water from fire-fighting and deluge systems in segregated sewers,
- Spills
- Water from safety showers,
- Water from testing of fire-fighting and deluge systems,

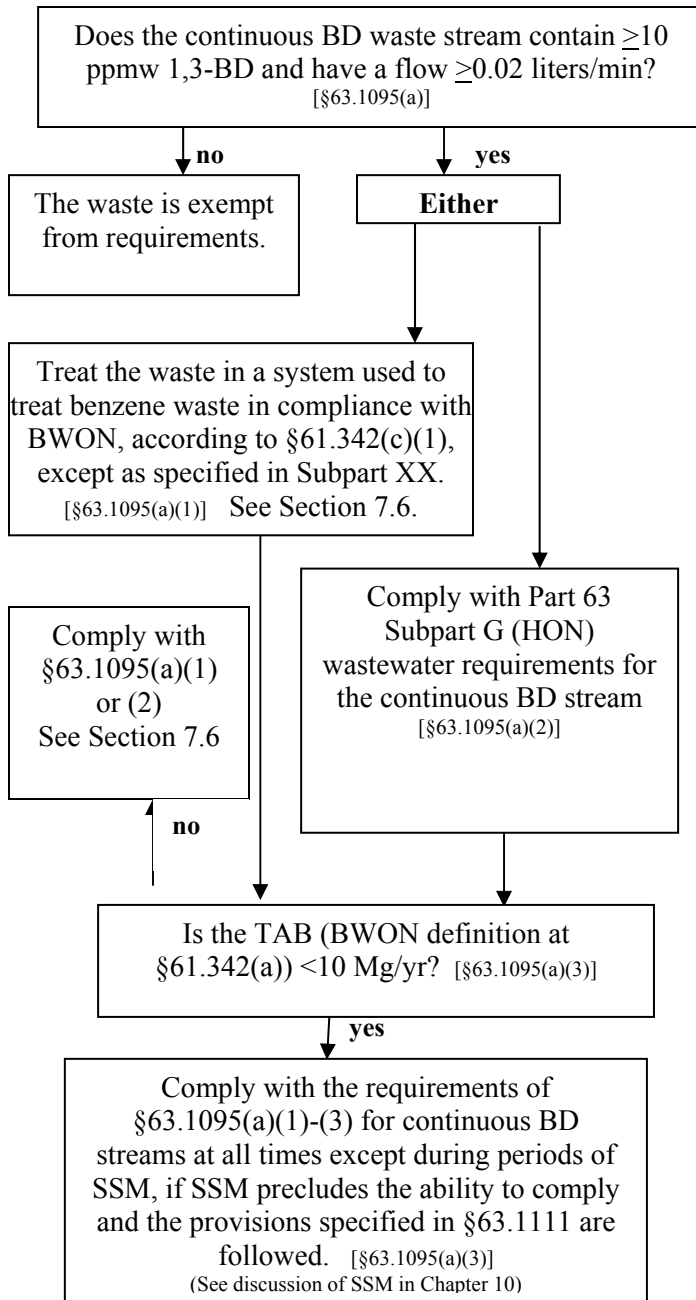
Figures 7-1 and 7-2 illustrate the applicability and general requirements for benzene waste streams and for continuous 1,3-butadiene waste streams, respectively. Also refer to Figures 7-3 and 7-4 for illustrations of BWON requirements and options.

NOTE: Other references should be consulted for detailed BWON requirements.

**Figure 7-1**  
**Treatment Options for Benzene Waste Streams (for waste treated on site)**



**Figure 7-2  
Treatment Options for Continuous 1,3-  
Butadiene Waste Streams  
(for waste treated on site)**



NOTE: SS&M exception does not apply to continuous butadiene streams or benzene-containing wastes at sites with a TAB ≥10 Mg/yr.

Overlap with other waste requirements [§63.1100(g)(6)]:

- A waste stream that is conveyed, stored, or treated in a wastewater stream management unit, waste management unit, or wastewater treatment system that receives streams subject to both the control requirements of these requirements for ethylene process unit waste streams and the provisions of Part 63 Subpart F §63.133 through §63.147 (HON) shall comply as specified below.

(A) Comply with the provisions in §§63.133 through §63.137 and §63.140 (HON wastewater requirements) for all equipment used in the storage and conveyance of the waste stream.

(B) Comply with the provisions in §§63.1103(e) (i.e. the applicability of ethylene process unit wastewater streams), §63.138, and §63.139 (HON) for the treatment and control of the waste stream.

(C) Comply with the provisions in §§63.143 through §63.148 (HON) for monitoring and inspections of equipment and for recordkeeping and reporting requirements. The owner or operator is not required to comply with the monitoring, recordkeeping, and reporting requirements associated with the treatment and control requirements in §§61.355 through 61.357.

- Compliance with §63.1103(e) (these requirements for ethylene process wastewater) shall constitute compliance with the Benzene Waste Operations NESHAP (Subpart FF of Part 61) for waste streams that are subject to both the control requirements of these requirements for ethylene production sources and the control requirements of Part 61 Subpart FF (BWON).

#### 7.4 Definitions (§63.1101)

Definitions applicable to ethylene process wastes can be found in §63.1082, §63.1103(e)(2) and §61.341 and are tabulated in Appendix A of this manual. Six definitions that are especially important for the understanding of this chapter are included here.

- *Continuous butadiene waste stream* means the continuously flowing process wastewater from the following equipment: The aqueous drain from the debutanizer reflux drum, water separators on the C4 crude butadiene transfer piping, and the C4 butadiene storage equipment; and spent wash water from the C4 crude butadiene carbonyl wash system. The continuous butadiene waste stream does not include butadiene streams generated from sampling, maintenance activities, or shutdown purges. The continuous butadiene waste stream does not include butadiene streams from equipment that is currently an affected source subject to the control requirements of another NESHAP. The continuous butadiene waste stream contains less than 10 parts per million by weight (ppmw) of benzene.
- *Dilution steam blowdown waste stream* means any continuously flowing process wastewater stream resulting from the quench and compression of cracked gas (the cracking furnace effluent) at an ethylene production unit and is discharged from the unit. This stream typically includes the aqueous or oily-water stream that results from condensation of dilution steam (in the cracking furnace quench system), blowdown from dilution steam generation systems, and aqueous streams separated from the process between the cracking furnace and the cracked gas dehydrators. The dilution steam blowdown waste stream does not include dilution steam blowdown streams generated from sampling, maintenance activities, or shutdown purges. The dilution steam blowdown waste stream also does not include blowdown that has

not contacted HAP-containing process materials.

- *Process wastewater* means water which comes in contact with benzene or butadiene during manufacturing or processing operations conducted within an ethylene production unit. Process wastewater is not organic wastes, process fluids, product tank drawdown, cooling water blowdown, steam trap condensate, or landfill leachate. Process wastewater includes direct-contact cooling water.
  - *Spent caustic waste stream* means the continuously flowing process wastewater stream that results from the use of a caustic wash system in an ethylene production unit. A caustic wash system is commonly used at ethylene production units to remove acid gases and sulfur compounds from process streams, typically cracked gas. The spent caustic waste stream does not include spent caustic streams generated from sampling, maintenance activities, or shutdown purges.
  - *Waste* means any material resulting from industrial, commercial, mining, or agricultural operations, or from community activities, that is discarded or is being accumulated, stored, or physically, chemically, thermally, or biologically treated prior to being discarded, recycled, or discharged.
- NOTE: This definition of waste is unusually broad and includes streams being recycled, either onsite or off.
- *Waste stream* means the waste generated by a particular process unit, product tank, or waste management unit. The characteristics of the waste stream (e.g., flow rate, HAP concentration, and water content) are determined at the point of waste generation. Examples of a waste stream include process wastewater, product tank drawdown, sludge and slop oil removed from waste management units, and landfill leachate.



**7.5 Major Differences between Subpart XX and BWON (§63.1092)**

Subpart XX requires compliance with the BWON, but with the following major differences:

- Subpart XX does not include a provision to exempt sources with a TAB quantity less than 10 megagrams per year (Mg/yr) from control requirements. In fact, it specifically overrides that provision in BWON for ethylene production units.

Total Annual Benzene (TAB), as defined by BWON, is the sum of the facility annual benzene quantity (prior to any treatment) in each waste stream that has a flow-weighted annual average water content greater than 10%, including wastes that are mixed with water or two phase wastes such that the water content of the mixture is greater than 10%. The TAB is measured for the facility, not simply the process unit.

Under BWON, if the facility TAB is less than 10 Mg/yr, the facility is exempt from the control and treatment requirements of BWON. As indicated in Section 7.1, this 10 Mg exemption does not exempt ethylene production units subject to the Ethylene MACT from the waste requirements of Subpart XX.

- The requirements for ethylene production sources apply to continuous butadiene waste streams that do not contain benzene quantities that would make them subject to the management and treatment requirements of BWON.
- The requirements for ethylene production sources do not include the compliance options at §61.342(c)(3)(ii), (d) and (e) of BWON for sources with a TAB quantity less than 10 Mg/yr.

NOTE: §61.342(c)(3) (i) is represented as Option 1 in Figure 7-3, and §63.342(c)(3)(ii), (d) and (e) are Options 2, 3 and 4 in Figure 7- 4.

- If you transfer wastes from your ethylene production process off-site, you must comply with the requirements in §63.1096 (offsite treatment requirements in Subpart XX) instead of the requirements in BWON for that waste.

**Figure 7-3  
Overview of BWON Requirements of §61.342(c)(1)-(c)(3)(i) for Waste Streams that Contain Benzene**

These requirements and options apply to the treatment of benzene- containing wastes from ethylene production units located at sites with a TAB ≥10 Mg/yr and to the treatment of spent caustic and dilution steam blowdown waste streams at sites with a TAB<10 Mg/yr.

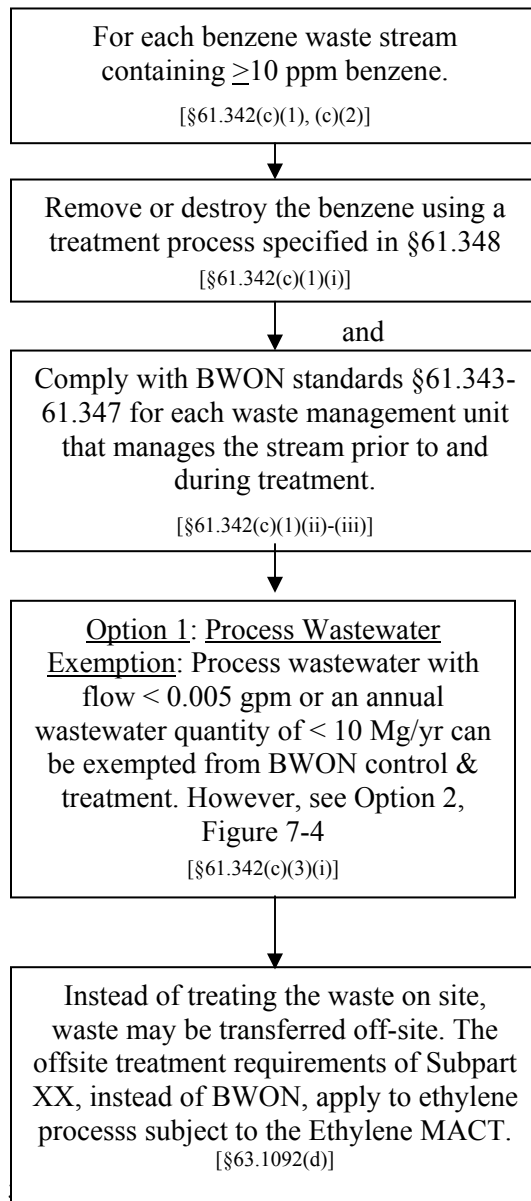
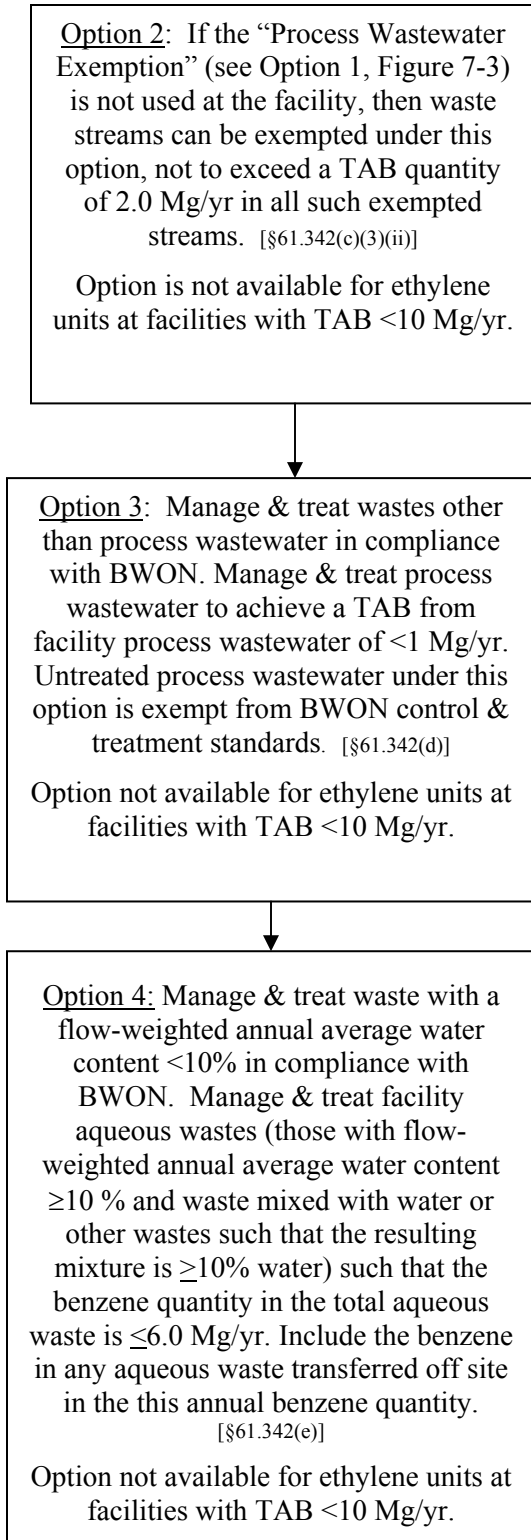


Figure 7-4

**Overview of Additional BWON Options for Benzene-Containing Waste Streams at facilities with TAB  $\geq 10$  Mg/yr**



**7.6 Waste Requirements - Continuous Butadiene Waste Streams (§63.1095)**

Subpart XX requires that continuous butadiene waste streams with  $\geq 10$  ppmw 1,3-butadiene and with a flow rate  $\geq 0.02$  liters per minute (0.005 gal/min) must be managed either in systems operated in compliance with BWON or systems operated in compliance with Part 63 Subpart G (HON). Records are required for continuous butadiene waste streams not requiring control (See Section 7.7).

When using a BWON system for management and treatment of continuous butadiene waste streams, the following requirements apply.

- Route the continuous butadiene stream to a treatment process or wastewater treatment system used to treat benzene waste streams that complies with the standards specified in §61.348 [BWON Treatment Standards]. Comply with the requirements of Part 61 Subpart FF; with the changes listed in Table 2 of Subpart XX, as summarized below.
- Determine the butadiene concentration of the waste stream according to §61.355(c)(1) through (3) [BWON Test Methods], except substitute “1,3-butadiene” for each occurrence of “benzene.” You may validate 40 CFR Part 136 methods for 1,3-butadiene according to the procedures in Appendix D to Part 63. You do not need to determine the butadiene concentration of a waste stream if you designate that the stream must be controlled.
- Comply with §61.342(c)(1)(ii) and (iii) for each waste management unit that receives or manages the waste stream prior to and during treatment or recycling of the waste stream. See Figure 7-3.

- If the facility TAB is <10 Mg/yr, comply with the requirements for continuous butadiene waste streams at all times except during periods of SSM, if the SSM precludes the ability to comply and the owner or operator follows the provisions as specified in §63.1111. See Chapter 10 for SSM requirements.

### 7.7 Recordkeeping Requirements - Continuous Butadiene Waste Streams (§63.1095(a)(1)(iii))

NOTE: The recordkeeping provisions of BWON still apply to benzene-containing streams subject to Subpart FF and remain unchanged by the Ethylene MACT. Those BWON requirements are not included in this discussion or in Chapter 11 of this manual.

For the continuous butadiene waste streams, comply with the recordkeeping requirements in §61.356(b), (b)(1) and (b)(2), except substitute “1,3-butadiene” for each occurrence of “benzene” and “continuous butadiene waste stream” for each occurrence of “waste stream.” Also see the Table 11-8 in Chapter 11.

- These substitutions have been made (in bold) in the copy of §61.356(b)(1) and (2) below.

NOTE: §61.356(b)(2)(ii) is not applicable to continuous butadiene waste streams and is deleted as specified in Table 2 of Subpart XX.

§61.356(b) Each owner or operator shall maintain records that identify each **continuous butadiene waste stream** at the facility subject to [Subpart FF], and indicate whether or not the **continuous butadiene waste stream** is controlled for **1,3-butadiene** emissions in accordance with [Subpart FF]. In addition the owner or operator shall maintain the following records:

(1) For each **continuous butadiene waste stream** not controlled for **1,3-butadiene** emissions in accordance with [Subpart FF], the records shall include all test results, measurements, calculations, and

other documentation used to determine the following information for the **continuous butadiene waste stream: continuous butadiene waste stream** identification, water content, whether or not the **continuous butadiene waste stream** is a process wastewater stream, annual waste quantity, range of **1,3-butadiene** concentrations, annual average flow-weighted **1,3-butadiene** concentration, and annual **1,3-butadiene** quantity.

(2) For each **continuous butadiene waste stream** exempt from §61.342(c)(1) (*i.e. exempt from the control requirements of BWON*) in accordance with §61.342(c)(3) (*i.e. de minimus flow*), the records shall include:

(i) All measurements, calculations, and other documentation used to determine that the continuous flow of process wastewater is less than 0.02 liters (0.005 gallons) per minute ... (*balance not applicable*)

NOTE: Water Content is not needed for 1,3-butadiene streams as a 1,3-butadiene stream does not have to contain a certain amount of water to be considered wastewater.

NOTE: Annual waste quantity refers to benzene waste quantity to identify those streams which must comply during SS&M per §63.1095(a)(3)

### 7.8 Reporting Requirements - Continuous Butadiene Waste Streams (§63.1095(a)(1)(iv))

NOTE: The reporting provisions of BWON apply to benzene-containing waste streams and remain separate and unchanged. The annual calculation methodology and reporting of TAB is not changed by the requirements for continuous butadiene waste streams. Those BWON provisions are not included in this discussion or in Chapter 12 of this manual.

For continuous butadiene waste streams, comply with the reporting requirements in §61.357(a), (a)(2), (a)(3), (a)(3)(iii) through (v), and (d)(1) and (2), except substitute “1,3-

butadiene” for each occurrence of “benzene” and “continuous butadiene waste stream” for each occurrence of “waste stream.” Also see the Tables in Chapter 12. These substitutions have been made (in bold) in the copy of §61.357(a) and (d)(1) and (2) below. Other changes in the report timing specified in Table 2 of Subpart XX are also included below in bold.

§61.357(a) Each owner or operator of an **Ethylene Production unit that is required to comply with Subpart XX**, and any facility managing wastes from these industries shall submit to the Administrator **as part of the Initial Notification required in 40 CFR §63.1110(c)**, or by the initial startup for a new source with an initial startup after the effective date, a report that summarizes the regulatory status of each **continuous butadiene waste stream** subject to §61.342 (*the BWON general standard*) and is determined by the procedures specified in §61.355(c) (*BWON test methods*) to contain **1,3-butadiene**. Each owner or operator subject to this subpart who has no **1,3-butadiene** onsite in wastes, products, by-products, or intermediates shall submit an initial report that is a statement to this effect. For all other owners or operators subject to this subpart, the report shall include the following information:

(2) A table identifying each **continuous butadiene waste stream** and whether or not the **continuous butadiene waste stream** will be controlled for **1,3-butadiene** emissions in accordance with the requirements of Subpart XX.

(3) For each **continuous butadiene waste stream** identified as not being controlled for **1,3-butadiene** emissions in accordance with the requirements of Subpart XX, the following information shall be added to the table:

(iii) Annual waste quantity for the **continuous butadiene waste stream**:

(iv) Range of **1,3-butadiene** concentrations for the **continuous butadiene waste stream**;

(v) Annual average flow-weighted **1,3-butadiene** concentration for the **continuous butadiene waste stream**;

(d)(1) **Submit as part of the Notification of Compliance Status required in 40 CFR §63.1110(d)**, or by the date of initial startup for a new source with an initial startup after the effective date, a certification that the equipment necessary to comply with these standards has been installed and that the required initial inspections or tests have been carried out in accordance with [Subpart FF]. If a waiver of compliance is granted under §61.11, the certification of equipment necessary to comply with these standards shall be submitted by the date the waiver of compliance expires.

(2) Beginning on the date that the equipment necessary to comply with these standards has been certified in accordance with paragraph (d)(1) of this section, the owner or operator shall submit annually to the Administrator a report that updates the information listed in paragraphs (a)(2) through (a)(3) of this section. If the information in the annual report required by paragraphs (a)(1) through (a)(3) of this section is not changed in the following year, the owner or operator may submit a statement to that effect.

NOTE: This report is due annually on the anniversary of NOCS, but could be consolidated with the BWON annual report (or Ethylene MACT periodic reports) by agreement with the Administrator. See Section 12.15 of Chapter 12 of this manual.

- Include only the information in §61.357(a)(2) and (a)(3)(iii) through (v) in the report required in §61.357(a) and (d)(2). *(Include in the initial and annual reports only the table listing the continuous butadiene waste streams, a statement indicating whether or not each stream will be controlled, and the additional documentation for the streams not controlled are included.)*

**Summary of reporting requirements for the Continuous Butadiene Wastes Streams**

**For the initial report and annual reports, include the following:**

(a)(2) A table identifying each **continuous butadiene waste stream** and whether or not the **continuous butadiene waste stream** will be controlled for **1,3-butadiene** emissions in accordance with the requirements of this subpart.

(a)(3) For each **continuous butadiene waste stream** identified as not being controlled for **1,3-butadiene** emissions in accordance with the requirements of this subpart the following information shall be added to the table:

(iii) Annual waste quantity for the **continuous butadiene waste stream**:

(iv) Range of **1,3-butadiene** concentrations for the **continuous butadiene waste stream**;

(v) Annual average flow-weighted **1,3-butadiene** concentration for the **continuous butadiene waste stream**;

- If the total annual benzene quantity from waste at your facility is less than 10 Mg/yr, manage and treat spent caustic waste streams and dilution steam blowdown waste streams according to §61.342(c)(1) through (c)(3)(i). See Figure 7-3. The requirements of this paragraph apply at all times except during periods of SS&M, if the SS&M precludes the ability of the affected source to comply with the requirements of this section and the owner or operator follows the provisions for periods of SS&M, as specified in §63.1111. See Chapter 10 for SS&M requirements. Also, see Table 12-27 in Chapter 12 for new reporting requirements.

- If the total annual benzene quantity from waste at your facility is greater than or equal to 10 Mg/yr, as determined according to §61.342(a), you must manage and treat waste streams according to any of the options in §61.342(c)(1) through (e). See Figures 7-3 and 7-4.

**7.10 Waste Requirements – Off-site Transfers (§63.1095)**

NOTE: These requirements apply to wastes required to be treated by §63.1095, but in lieu of on-site treatment are shipped offsite for treatment. These requirements apply instead of the offsite requirements of §61.342(f) in BWON for benzene-containing wastes from ethylene production units.

If you elect to transfer off-site, waste generated by the ethylene production unit that contains  $\geq 10$  ppm total benzene and 1,3-butadiene, you must comply as follows:

- Include a notice with the shipment or transport of each waste stream. The notice shall state that the waste stream contains benzene and 1,3-butadiene that are to be treated in accordance with the provisions of 40 CFR Part 63 Subpart XX. When the transport is continuous or ongoing (for example, discharge to a publicly-owned treatment works), the notice shall be submitted to the treatment operator

**7.9 Waste Requirements - Benzene Waste Streams (§63.1095)**

For benzene-containing streams, comply with the requirements of BWON, except as specified in Table 2 of Subpart XX. Manage and treat waste streams as specified in either paragraph below.

initially and whenever there is a change in the required treatment.

- You may not transfer the waste stream unless the transferee has submitted to the Administrator a written certification that the transferee will manage and treat any waste stream received from a source subject to the requirements of Subpart XX in accordance with the requirements of Subpart XX.
- By providing this written certification to the Administrator, the certifying entity accepts responsibility for compliance with the regulatory provisions in Subpart XX with respect to any shipment of waste covered by the written certification. Failure to abide by any of those provisions with respect to such shipments may result in enforcement action by EPA against the certifying entity in accordance with the enforcement provisions applicable to violations of those provisions by owners or operators of sources.
- The certifying entity may revoke the written certification by sending a written statement to the Administrator and you. The notice of revocation must provide at least 90 days notice that the certifying entity is rescinding acceptance of responsibility for compliance with the regulatory provisions of Subpart XX. Upon expiration of the notice period, you may not transfer the waste stream to that off-site treatment operation. Written certifications and revocation statements to the Administrator from the transferees of waste shall be signed by the responsible official of the certifying entity, provide the name and address of the certifying entity, and be sent to the appropriate EPA Regional Office at the addresses listed in 40 CFR §63.13. Such written certifications are not transferable by the treater to other off-site waste treatment operators.

# Ethylene MACT Compliance Manual

## Chapter 8

### Heat Exchange Systems

#### Chapter 8 Index

- 8.1 *Overview*
- 8.2 *Structure of the Rule*
- 8.3 *Applicability*
- 8.4 *Definitions*
- 8.5 *Monitoring Requirements*
- 8.6 *Repair Requirements*
- 8.7 *Delay of Repair*
- 8.8 *Recordkeeping*
- 8.9 *Reporting*

#### 8.1 Overview

These provisions of the Ethylene MACT specify requirements for heat exchange systems at ethylene production units. Both recirculating cooling tower systems and once-through cooling water systems are included. The provisions require monitoring for leaks and repair of any leaks found. The definition of a leak depends upon which compliance option is elected, and can be an Appendix D organic HAP leak rate ( $\geq 6.75$  pounds per hour (pph) or 10% increase for the heat exchange system), a n Appendix D organic HAP concentration ( $\geq 1$  ppmw or 10% increase, whichever is greater, for an individual heat exchanger), or a change in a surrogate parameter. Detection of a leak triggers the repair provisions. Leaks must be repaired within 45 days unless a delay or repair option is applicable.

Because of the wide variability in ethylene process heat exchange systems, Subpart XX includes flexibility for the source to define the equipment that comprises each heat exchange system (Option 1 in Section 8.5). The basic

requirement in making this designation is that the resulting water flow rate and the level of analytical detection for the Appendix D organic HAP must result in the capability to detect a leak of 6.75 pph (3.06 kg/hr) in each system.

#### 8.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in Table 7 of §63.1103(e), that ethylene processes must comply with the provisions of Part 63 Subpart XX to control HAP emissions from ethylene process heat exchange systems. Subpart XX is discussed in this chapter. The applicable sections of Subpart XX are:

§63.1080 What is the purpose of this subpart?

§63.1081 When must I comply with the requirements of this subpart?

§63.1082 What definitions do I need to know?

§63.1083 Does this subpart apply to my heat exchange system?

§63.1084 What heat exchange systems are exempt from the requirements of this subpart?

§63.1085 What are the general requirements for heat exchange systems?

§63.1086 How must I monitor for leaks to cooling water?

§63.1087 What actions must I take if a leak is detected?

§63.1088 In what situations may I delay leak repair, and what actions must I take for delay of repair?

§63.1089 What record must I keep?

§63.1090 What reports must I submit?

### 8.3 Applicability

The rule applies to ethylene production unit heat exchange systems that cool process fluids containing  $\geq 5$  wt.% of the sum of the HAPs listed in Table 1 of Subpart XX (reproduced as Table 8-1 below and attached as Appendix D), with the exceptions indicated below.

Exceptions: Heat exchange systems meeting the following criteria are exempt from the requirements of Subpart XX.

- Heat exchange systems that operate with the minimum pressure on the cooling water side at least 35 kilopascals (5.076 psi) greater than the maximum pressure on the process side.
- Heat exchange systems that contain an intervening cooling fluid, containing less than 5 wt. % of total HAP listed in Table 8-1, between the process and the cooling water. This intervening fluid must serve to isolate the cooling water from the process fluid and must not be sent through a cooling tower or discharged. For purposes of this section, discharge does not include emptying for maintenance purposes.
- Heat exchange systems that are once through and are subject to a National Pollution Discharge Elimination System (NPDES) permit with an allowable discharge limit of 1 part per million by volume (ppmv) or less above influent concentration, or 10 % or less above influent concentration, whichever is greater.
- Heat exchange systems that are once through and are subject to a NPDES permit that meets all of the following conditions.
  - (1) The permit requires monitoring of a parameter or condition to detect a leak of process fluids to cooling water.
  - (2) The permit specifies the normal range of the parameter or condition.
  - (3) The permit requires monthly or more frequent monitoring for the parameters selected as leak indicators.

- (4) The permit requires you to report and correct leaks to the cooling water when the parameter or condition exceeds the normal range.

**Table 8-1**  
**HAPs for Heat Exchange Systems**  
**(Table 1 of Subpart XX)**

benzene	naphthalene	m-xylene
cumene	styrene	p-xylene
ethylbenzene	toluene	o-xylene
hexane	1,3-butadiene	

Under Subpart XX Option 1 (see Section 8.5), a heat exchange system may consist of an entire heat exchange system or any combinations of heat exchangers such that, based on the rate of cooling water flow and the sensitivity of the test method used, a leak of 6.75 lbs/hr (3.06 kg/hr) or greater of the HAP listed in Table 8-1 would be detected. The ethylene process owner or operator can define the equipment that comprises each heat exchange system, consistent with this requirement.

### 8.4 Definitions

Definitions applicable to ethylene process heat exchange systems can be found in §63.1082(b) and §63.1103(e)(2) and are compiled in Appendix A of this manual. The definition of “heat exchange system,” which appears in both cited locations, is repeated here due to its importance to this chapter.

*Heat exchange system* means any cooling tower system or once-through cooling water system (e.g., river or pond water). A heat exchange system can include an entire recirculating or once-through cooling system.

### 8.5 Monitoring Requirements (§63.1086)

Three monitoring options are provided by Subpart XX. You may monitor each heat exchange system, you may monitor each heat exchanger or you may monitor a surrogate parameter for either the heat exchanger system or an individual heat exchanger. Leak criteria are different for each option.



Monitoring Option 1: Monitor each heat exchange system, as follows, for the HAP listed in Table 8-1 (either total or speciated) or for other representative substances (e.g., TOC or VOC).

- (1) Define the equipment that comprises each heat exchange system. A heat exchange system may consist of an entire heat exchange system or any combinations of heat exchangers such that, based on the rate of cooling water at the entrance and exit to each heat exchange system and the sensitivity of the test method being used, a leak of 6.75 lb/hr (3.06 kg/hr) or greater of the HAP in Table 8-1 would be detected. For example, if the test you decide to use has a sensitivity of 1 ppmw for total Table 8-1 HAP, you must define the heat exchange system so that the cooling water flow rate is 13,481 gpm (51,031 lpm) or less so that a leak of 6.75 lb/hr (3.06 kg/hr) can be detected.
- (2) At new sources (see Appendix A) initially monitor each heat exchange system weekly for 6 months. If no leaks are detected by monitoring weekly, monitor monthly thereafter until a leak is detected. If a leak is detected, monitor weekly until the leak has been repaired and then for an additional six months. If no leaks are detected by monitoring weekly, monthly monitoring may be resumed.

At existing sources (see Appendix A) initially monitor each heat exchange system monthly for 6 months. If no leaks are detected by monitoring monthly, monitor quarterly thereafter until a leak is detected. If a leak is detected, monitor monthly until the leak has been repaired and then for an additional six months. If no leaks are detected by monitoring monthly, quarterly monitoring may be resumed.

- (3) Determine the concentration of the monitored substance in the heat exchange system cooling water using any method listed in 40 CFR Part 136. Use the same method for both entrance and exit samples. You may validate Part 136

methods for the HAP listed in Table 8-1, according to the procedures in Appendix D to Part 63. Alternative methods may be used upon approval by the Administrator.

NOTE: EPA has approved the use of SW-8260 (from SW-846) in response to such a request for one ethylene site.

- (4) Take a minimum of three sets of samples at each entrance and exit.
- (5) Calculate the average entrance and exit concentrations, correcting for the addition of make-up water and evaporative losses, if applicable. Using a one-sided statistical procedure at the 0.05 level of significance, if the exit mean concentration is at least 10 percent greater than the entrance mean, and a leak of 6.75 lb/hr (3.06 kg/hr) or greater of the HAP (total or speciated) in Table 8-1 or other representative substance into the cooling water is detected, you have detected a leak. See the example calculation at end of Chapter 8.

NOTE: Under Option 1, you may assume the entrance mean concentration of the monitored substance is zero or determine the entrance mean concentration of the monitored substance at a sampling location anywhere upstream of the heat exchange system, provided that there is not a reasonable opportunity for the concentration to change at the entrance to each heat exchange system.

Monitoring Option 2: Monitor the cooling water at the entrance and exit of each heat exchanger for the HAP in Table 8-1 (either total or speciated) or other representative substances (e.g., TOC or VOC).

- (1) At new sources (see Appendix A) initially monitor each heat exchange system weekly for 6 months. If no leaks are detected by monitoring weekly, monitor monthly thereafter until a leak is detected. If a leak is detected, monitor weekly until the leak has been repaired and then for an additional six months. If no leaks are detected by monitoring weekly, monthly monitoring may be resumed.

At existing sources (see Appendix A) initially monitor each heat exchange system monthly for 6 months. If no leaks are detected by monitoring monthly, monitor quarterly thereafter until a leak is detected. If a leak is detected, monitor monthly until the leak has been repaired and then for an additional six additional months. If no leaks are detected by monitoring monthly, quarterly monitoring may be resumed.

- (2) Determine the concentration of the monitored substance in the heat exchange system cooling water using any method listed in 40 CFR Part 136. Use the same method for both entrance and exit samples. You may validate Part 136 methods for the HAP listed in Table 8-1 according to the procedures in Appendix D to Part 63. Alternative methods may be used upon approval by the Administrator.

NOTE: EPA has approved the use of SW-8260 (from SW-846) in response to such a request for one ethylene site.

- (3) Take a minimum of three sets of samples at each entrance and exit.
- (4) Calculate the average entrance and exit concentrations, correcting for the addition of make-up water and evaporative losses, if applicable. Using a one-sided statistical procedure at the 0.05 level of significance, if the exit mean concentration is at least 1 ppmw or 10 percent greater than the entrance mean, whichever is greater, you have detected a leak. See example calculation at end of Chapter 8.

NOTE: Under Option, 2 you may assume the entrance mean concentration of the monitored substance is zero or determine the entrance mean concentration of the monitored substance at a sampling location anywhere upstream of the heat exchanger, provided that there is not a reasonable opportunity for the concentration to change at the entrance to each heat exchanger.

Monitoring Option 3: Monitor the cooling water using a surrogate indicator of leaks (e.g., ion specific electrode monitoring, pH, conductivity).

- (1) Prepare and implement a monitoring plan that documents the procedures that will be used to detect leaks of process fluids into cooling waters. The plan shall require monitoring of one or more process parameters or other conditions that indicate a leak. Monitoring that is already being conducted for other purposes may be used. The plan shall include the following information:

- A description of the parameter or condition to be monitored and an explanation of how the selected parameter or condition will reliably indicate the presence of a leak.
- The parameter level(s) or condition(s) that shall constitute a leak. This shall be documented by data or calculations showing that the selected levels or conditions will reliably identify leaks. The monitoring must be sufficiently sensitive to determine the range of parameter levels or conditions when the system is not leaking. When the selected parameter level or condition is outside that range, you have detected a leak.
- The monitoring frequency (see item (2)).
- The records that will be maintained to document compliance.

- (2) At new sources (see Appendix A) initially monitor each heat exchange system weekly for 6 months. If no leaks are detected by monitoring weekly, monitor monthly thereafter until a leak is detected. If a leak is detected, monitor weekly until the leak has been repaired and then for an additional six months. If no leaks are detected by monitoring weekly, monthly monitoring may be resumed.

At existing sources (see Appendix A) initially monitor each heat exchange system monthly for 6 months. If no leaks are detected by monitoring monthly, monitor quarterly thereafter until a leak is detected. If a leak is detected, monitor monthly until the leak has been repaired and then for an additional six additional months. If no leaks are detected by monitoring monthly, quarterly monitoring may be resumed.

- (3) If a leak is identified by audio, visual, or olfactory inspection, a method listed in 40 CFR Part 136, or any other means other than those described in the monitoring plan, and the method(s) specified in the plan could not detect the leak, you must revise the plan and document the basis for the changes. You must complete the revisions to the plan no later than 180 days after discovery of the leak.

#### **8.6 Repair Requirements (§63.1087)**

If a leak is detected, repair the leak as soon as practical but not later than 45 calendar days after you received the results of the monitoring tests that indicated a leak. You must repair the leak unless you demonstrate that the results are due to a condition other than a leak. Once the leak has been repaired, monitor within 7 calendar days of the repair or startup, whichever is later, to confirm that the heat exchange system has been repaired.

As detailed in Section 8.5, monthly monitoring is required for existing sources and weekly monitoring for new sources for six months following a repair.

#### **8.7 Delay of Repair (§63.1088)**

You may delay the repair of heat exchange systems if the leaking equipment is isolated from the process.

You may also delay repair if repair is technically infeasible without a shutdown and you meet one of the following conditions.

- A shutdown is expected within the next two months of determining delay of repair is necessary.

- A shutdown is not expected within the next two months of determining delay of repair is necessary, but you determine a shutdown for repair would cause greater emissions than the potential emissions from delaying repair until the next shutdown of the process equipment associated with the leaking heat exchanger. You must document the basis for the determination. See Table 11-9 of Chapter 11.
- The necessary equipment, parts or personnel are not available. Under this condition you may delay repair a maximum of 120 calendar days. You must demonstrate that the necessary equipment, parts or personnel were not available.

#### **8.8 Recordkeeping (§63.1089)**

A number of records are required relative to the heat exchanger monitoring and repair requirements of Subpart XX. See Table 11-9 in Chapter 11 of this manual for specific requirements.

Additionally, §63.1086(d)(3) requires, if using monitoring Option 3 (surrogate parameter monitoring), that you maintain the monitoring plan that is currently in use on-site or such that it is accessible from a central location by computer or other means that provide access within two hours after a request. If the monitoring plan is changed, you must retain the most recent superseded plan for at least five years from the date of its creation. The superseded plan must be retained on-site or accessible from a central location by computer or other means that provide access within two hours after a request.

#### **8.9 Reporting (§63.1090)**

Information related to delay of repair occurrences must be reported in the Ethylene MACT periodic report. See Table 12-9 in Chapter 12 of this manual for specific requirements.

Example Leak Calculation – Option 1 and 2 (see Section 8.5)

Cooling Tower: XYZ Cooling Tower

Date of Analysis: Whenever, 2XXX

	CTW Supply (HE Entrance) ppb	CTW Return (HE Exit) ppb
Sample 1	10	11
Sample 2	10	11
Sample 3	12	11

AVERAGE - ppb                      10.7                      11.0  
 DELTA - ppb                              0.3  
 110% of the HE Entrance – ppb      11.77

Maximum HE System Flow - gpm      60,000  
 Calculated Leak Rate - pph              0.01  
 6.75 pph HAP and 10% increase  
 HAP test                                      NO LEAK              0.01<6.75  
     NO LEAK              11.0<11.77

**1 ppmw test used instead of lb/hr for Option 2.**

TTEST (One tailed distribution,  
 paired T-Test)                              0.333333333

To determine whether analytical data indicates  
 a statistically significant leak.

Explanation:                                      If TTEST is >0.05, then there is no leak

ANSWER:

**No leak since data does not meet the 0.05 level of significance**

**Ethylene MACT Compliance Manual**  
**Chapter 9**  
**Closed Vent Systems and Control Devices**

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**9.1 Overview**

Part 63 Subpart SS applies to the closed vent systems (CVS) and control devices (CD) that are required to transport and control air emissions from ethylene processes. CVS and CD's used for ethylene waste and wastewater emissions are subject to the requirements of §61.349 in the Benzene Waste Operations (BWON) rule instead of these Subpart SS requirements. While similar, the requirements imposed by the BWON rule on CVS and CD are different in several details from those in Subpart SS and they should be carefully reviewed in developing wastewater compliance systems. Only the requirements of Subpart SS are comprehensively reviewed here.

Requirements in Subpart SS (§63.982(e) and §63.993) for recovery devices used in some regulations to comply with the process vent provisions by controlling vent Total Resource Efficiency (TRE) to above the Group 1 TRE trigger level, do not apply to ethylene process vents per §63.1103(e)(3).

A few additional requirements for CVS and CD are contained in Subparts UU (the equipment leak requirements) and YY (the Generic MACT standard that includes ethylene processes) and are indicated in the appropriate paragraphs of this chapter.

**9.2 Structure of the Rule**

Subpart YY, the Generic MACT standard, specifies that ethylene process emissions requiring control must comply with the requirements of Subpart SS. The applicable paragraphs within that subpart are as follows:

- §63.980 Applicability
- §63.981 Definitions
- §63.982 Requirements
- §63.983 Closed Vent Systems

§63.984 Fuel Gas Systems and Processes to which Storage Vessel, Transfer Rack, or Equipment Leak Regulated Material Emissions are Routed

§63.985 Nonflare Control Devices used to Control Emissions from Storage Vessels and Low Throughput Storage Racks

§63.986 Nonflare Control Devices used for Equipment Leaks Only.

§63.987 Flare Requirements

§63.988 Incinerators, Boilers, and Process Heaters

§63.990 Absorbers, Condensers and Carbon Adsorbers used as Control Devices

§63.992 Implementation and Enforcement

§63.993 Absorbers, Condensers, Carbon Adsorbers and Other Recovery Devices used as Final Recovery Devices (not applicable to Ethylene MACT)

§63.994 Halogen Scrubbers and Other Halogen Reduction Devices

§63.995 Other Control Devices

§63.996 General Monitoring Requirements for Control and Recovery Devices

§63.997 Performance Test and Compliance Assessment Requirements for Control Devices

§63.998 Recordkeeping Requirements

§63.999 Notifications and Other Reports

**9.3 Subpart SS Applicability (§63.980)**

Subpart SS applies when referenced from another subpart and has no applicability of its own. Part 63 General Provisions do not apply to Subpart SS requirements, except as specified in a referencing subpart.

Ethylene MACT does apply the start-up, shutdown and malfunction (SS&M) provisions of §63.1111 (see Chapter 10), so the SS&M plan applies to CVS and CDs during SS&M periods, rather than Subpart SS requirements. The requirements of Subpart SS described in this chapter apply to CVS and CD that are used to comply with the requirements of the other chapters of this manual, as indicted in Table 9-1.

**Table 9-1  
Subpart SS Applicability for Ethylene Processes**

<b>Emission Type</b>	<b>Referenced from</b>	<b>Subpart SS Reference</b>
Storage vessels, Chapter 3	Table 7 of §63.1103(e)	§63.982(a)(1)
Process Vents, Chapter 4	Table 7 of §63.1103(e)	§63.982(b) and (c)(2)
Transfers, Chapter 6	§63.1105(a)(1), (2) and (3)	§63.982(a)(3)
Equipment Leaks, Chapter 5	§63.1034 of Subpart UU	General Subpart SS reference.

**9.4 Definitions (§63.981)**

Definitions from Subpart SS, the BWON rule, subpart UU and Subpart YY, applicable to CVS and CD systems are included in Appendix A. Although many of the definitions in the BWON rule and in Subpart SS are similar to each other and to those in most other CVS and CD rules, there are some differences and the definitions applicable to the CVS and CD systems under consideration should be used.

A few definitions critical to this chapter follow:

*Closed vent system* means a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission point to a control device. A closed vent system does not include the vapor collection system that is part of any tank truck or railcar or the loading arm or hose that is used for vapor return. For transfer racks, the closed vent system begins at, and includes, the first block valve on the downstream side of the loading arm or hose used to convey displaced vapors (§63.1101 of Subpart YY).

NOTE: Definitions in §61.341 and §63.1020 for Ethylene MACT waste and equipment leak components complying with Subpart UU only contain the first sentence. The definition in §63.981 for Ethylene MACT CVS and CD complying with Subpart SS ends after “railcar” in the second sentence.)

*Control device* means, with the exceptions noted below, a combustion device, recovery device, recapture device, or any combination of these devices used to comply with [Subpart YY or Subpart SS]. For process vents from continuous unit operations at [affected sources] where the applicability criteria includes a TRE index value, recovery devices are not considered to be control devices. Primary condensers on steam strippers or fuel gas systems are not considered to be control devices. (§63.981 and §63.1101 - Does not apply to BWON waste requirements for ethylene production sources.)

NOTE: The second sentence of the control device definition does not apply for Ethylene MACT, since TRE is not used as the process vent control criteria.

*Control device* means any combustion device, recovery device, recapture device, or any combination of these devices used to comply with [Subpart UU]. Such equipment or devices include, but are not limited to, absorbers, carbon adsorbers, condensers, incinerators, flares, boilers, and process heaters. Primary condensers on steam strippers or fuel gas systems are not considered control devices. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Control device* means an enclosed combustion device, vapor recovery system, or flare. (§61.341 – Applies for Ethylene MACT BWON wastes.)

**9.5 Requirements (§63.982)**

This section of Subpart SS identifies which specific requirements in the subpart apply for each emission type. For storage vessels, transfer racks and equipment leaks, the Ethylene MACT allows all of compliance options identified in this section. However, for

process vents only the two control options (i.e., CVS to flare and CVS to nonflare CD) provided by Subpart SS are allowed by the reference from Table 7 of Subpart YY. The recovery device option (§63.982(e)) for process vents is not applicable to ethylene process vents, since the TRE approach is not allowed per §63.1103(e)(3) (Table 7). Additionally, §63.1105 allows a vapor recovery option for transfer rack emissions.

**Table 9-2  
Allowed Subpart SS Options for Ethylene Processes**

<b>Emission Type</b>	<b>Options</b>
Storage vessels §63.982(a)(1)	1. CVS to Flare - §63.982(b) 2. CVS to nonflare CD - §63.982(c)(1) 3. Route to fuel gas or process - §982(d)  NOTE: Table 7 also allows the floating roof options of Subpart WW for certain storage tanks, as discussed in Chapter 3.
Process Vents §63.982(a)(2)	1. CVS to Flare - §63.982(b) 2. CVS to nonflare CD - §63.982(c)(2)
Equipment Leaks §63.982(a)(4)	1. CVS to Flare. - §63.982(b) 2. CVS to nonflare CD - §63.982(c)(3) 3. Route to fuel gas or process - §63.982(d)
Transfers §63.1105(a) and §63.982(a)(3)	1. CVS to Flare - §63.982(b) 2. CVS to nonflare CD - §63.982(a)(1) ( low throughput racks) 3. CVS to nonflare CD - §63.982(c)(2) (high throughput racks) 4. Route to fuel gas or process - §63.982(d) 5. Vapor recovery - §63.1105(a)(4)

**Control of Combined Emissions:**

When emissions of different types are combined for control in a common control device, §63.982(f) provides a hierarchy that may be used so only one set of Subpart SS requirements need be followed. The hierarchy is:

- Process vent requirements.
- High throughput transfer rack requirements.
- Storage vessel and low throughput transfer rack requirements,
- By default, equipment leak requirements.

Overlaps with wastewater emission control requirements are not addressed in Subpart SS and thus the requirements of §61.349 of BWON would apply to CVS and CD, in addition to Subpart SS requirements, where combined vent streams include BWON regulated wastewater emissions.

**9.6 Closed Vent Systems (CVS) (§63.983)**

A CVS collects and transports emissions from the emission point to a control device. A CVS must be operated whenever regulated emissions are vented.

Exceptions:

- Vapor collection systems that are part of a tank truck or railcar are not considered CVS.
- Systems that route storage vessel, transfer rack or equipment leak emissions to a fuel gas system or to a process are not considered CVS.
- CVS operated and maintained under negative pressure are exempted from most requirements.

A CVS used for transfer racks must be designed and operated so that vapors collected at one loading arm do not pass through another loading arm to the atmosphere. Additionally, any pressure relief device in a transfer rack CVS may not open to the atmosphere during loading, except for safety reasons. §63.1105(f) and (g) of Subpart YY

requires that only railcars or tank trucks with vapor connections compatible with the CVS (or process piping) may be loaded and that the systems must be connected during loading.

§63.983(a)(3) specifies requirements for bypass lines that could divert a vent stream to the atmosphere. For each such line, the owner/operator may: 1) install a flow indicator which takes a reading at least every 15 minutes, or 2) install a car seal or key and lock device, which is visually inspected at least once per month. Records are required as detailed in Table 11-10 of Chapter 11 to identify any periods when bypassing may have occurred. Any such periods must be reported in the Ethylene MACT periodic report as specified in Table 12-10 of Chapter 12.

Exception:

Equipment needed for safety purposes such as pressure relief devices, low leg drains, high point bleeds, analyzer vents, and open-ended valves or lines are exempt from the bypass monitoring provisions.

CVS must be inspected per §63.983(b) using procedures similar to those used for equipment leak monitoring. However, all equipment in the CVS is subject to the same leak definition, 500 ppm. For systems composed of hard pipe, an initial Method 21 monitoring is required per procedures specified in §63.983(c) followed by annual visual, audible and olfactory inspections. For systems involving ductwork, initial and annual Method 21 monitoring is required. For transfer racks, the CVS monitoring must be performed during a loading operation or with the system pressured to loading operating conditions (see §63.983(c)(4)). See Chapter 5 for a summary monitoring procedures.

Exception:

CVS components that are designated as unsafe- or difficult-to-inspect are exempt from the normal inspection requirements. The criteria for these designations are contained in §63.983(b)(2) and (3). A written plan for each exempt category is required that provides for the inspection of unsafe-to-inspect equipment



when possible and difficult-to-inspect equipment at least every five years.

If a CVS leak is identified during an annual visual inspection, the owner/operator may eliminate the leak or monitor it by the procedures in §63.983(c) to determine if it exceeds 500 ppm.

CVS leaks must be repaired as soon as practical per §63.983(d), with a first attempt at repair being made no later than five days after the leak is detected. Unless delay of repair provisions are in effect, repairs must be completed no later than 15 days after the leak is detected or when Appendix D organic HAP is next introduced, whichever is later. Delay beyond 15 days is only allowed if:

- 1) Repair within 15 days is technically infeasible or unsafe without a CVS shutdown (defined in §63.981 and Appendix A), or
- 2) The emissions resulting from immediate repair would be greater than the emissions likely to result from delay of repair. Delay of repair components must be repaired as soon as practicable and no later than by the end of the next CVS shutdown.

**9.7 Storage Vessel, Transfer Rack and Equipment Leak Emissions Routed to Fuel Gas Systems or Processes (§63.984)**

Since gas streams routed to fuel gas systems and processes are not process vents (see Chapter 4), the provisions of §63.984 do not address such streams. Additionally, the BWON rule handles such streams differently from Subpart SS and that rule should be consulted for regulated ethylene process waste and wastewater emissions which are routed to fuel gas or process.

Fuel gas systems and processes receiving regulated streams must be operating when regulated emissions are routed to them.

When routed to a process the Appendix D organic HAP must be:

- (i) Recycled and/or consumed in the same manner as a material that fulfills the same function in that process;

- (ii) Transformed by chemical reaction into materials that are not regulated materials;

- (iii) Incorporated into a product; and/or

- (iv) Recovered.

For storage vessels, a design evaluation is required to provide a record that one of the above criteria is met.

No performance testing or design evaluations are required for streams routed to fuel gas systems.

Special requirements for transfer rack emissions:

Except for safety purposes, no pressure relief device in a transfer rack vapor system may open to the atmosphere during loading. (§63.984(a)(2) and §63.1105(e))

§63.1105(a)(4) provides an option to route transfer rack vapors in process piping to a vapor balance system that sends them to a storage vessel.

**9.8 Nonflare Control Devices Used to Control Emissions from Storage Vessels and Low Throughput Transfer Racks (§63.985)**

Nonflare control devices used for storage vessels (SV) and low throughput transfer racks (LTTR) (see Chapter 6) are subject to reduced requirements.

For these CDs the owner/operator may, as an alternate to performance test requirements, use a “design evaluation” to demonstrate that the 98% reduction requirement (or 20 ppm alternate for transfer racks) is met. §63.985(b)(1) identifies the types of engineering information that must be used for the design evaluation.

Exceptions:

Design evaluations or performance tests are not required if:

- A prior design evaluation or performance test meeting the requirements of §63.997 (See 9.18) was done.

- The CD is a boiler or process heater with design heat input  $\geq 150$  MBTU/hr or where the vent stream is introduced with the primary fuel.  
NOTE: If the vent stream is introduced with primary fuel this emission may be subject to the “route to fuel gas” option requirements discussed in 9.7 instead of the requirements discussed in this section.
- The CD is a boiler or process heater burning hazardous waste and has a final permit under 40 CFR Part 270 and complies with 40 CFR Part 266 Subpart H.
- The CD is a boiler or process heater burning hazardous waste and has certified compliance with the interim status requirements of 40 CFR Part 266 Subpart H.
- The CD is an incinerator burning hazardous waste and has a final permit under 40 CFR Part 270 and complies with 40 CFR Part 264 Subpart O.
- The CD is an incinerator burning hazardous waste and has certified compliance with the interim status requirements of 40 CFR Part 265 Subpart O.

Additionally, for these emission types the requirements for ongoing compliance monitoring do not apply. Rather, the owner/operator must submit a monitoring plan with the Notice of Compliance Status, and then comply with that plan. The plan, and ultimately the source’s Title V permit, must specify the monitoring that will be performed and the parameter limits, averaging time, etc. that will be used to demonstrate compliance.

**9.9 Nonflare Control Devices Used Only for Equipment Leaks (§63.986)**

Nonflare CDs handling only equipment leak emissions are not required to conduct performance tests or design evaluations to demonstrate compliance with the 95% or 20 ppm control requirement of §63.1034(b)(2)(i) or (ii) of Subpart UU.

Such devices must be monitored to confirm they are operated and maintained in conformance with their design, but none of the specific monitoring of Subpart SS for CDs handling other types of vents is required and no monitoring plan is required. Records are required (§63.998(d)(4)) to support the CD and monitoring adequacy and for demonstrating ongoing compliance (see Table 11-12).

**9.10 Flares (§63.987)**

Flares must meet the requirements of §63.11(b) of Part 63 Subpart A (General Provisions). §63.987(b) and portions of §63.997 specify the requirements for flare compliance assessments. §63.987(c) specifies flare monitoring requirements. §63.11(b) as of November 2004, including the changes specified in §63.987 and §63.997, is included as Appendix C of this manual.

Flares used to control ethylene process waste emissions must comply with §61.349(a)(2)(iii) of BWON, which references §60.18 rather than §63.11. The requirements of BWON and Part 61 Subpart A apply to these flares for testing, monitoring, recordkeeping and reporting. While the requirements of §63.11 and §60.18 are virtually identical, the requirements of §63.987(b) and (c) would not specifically apply to flares used exclusively for ethylene process waste and wastewater emission control.

**9.11 Incinerators, Boilers and Process Heaters (§63.988)**

Paragraph §63.988 applies when incinerators, boilers or process heaters are used as CDs to meet a weight percent reduction or a ppmv outlet requirement. Such CDs must be operated whenever emissions are routed to them and the emissions must be introduced into the flame zone of the device.

Initial performance testing is required per the performance test provisions of §63.997 (see 9.18.) SVs and LTTR may do a design evaluation instead, as discussed in 9.8.

Exceptions:

Design evaluations or performance tests are not required if:

- Only emissions from equipment leaks are combusted (See 9.9).
- A previous performance test was done meeting the requirements of §63.997(b) (See 9.18).
- The CD is a boiler or process heater that has a design heat input  $\geq 150$  MBTU/hr or the vent stream is introduced with the primary fuel.

NOTE: If the vent stream is introduced with primary fuel this emission may be subject to the “route to fuel gas” option requirements discussed in 9.7 instead of the requirements discussed in this section.

- The CD is a boiler or process heater burning hazardous waste and has a final permit under 40 CFR Part 270 and complies with 40 CFR Part 266 Subpart H.
- The CD is a boiler or process heater burning hazardous waste and has certified compliance with the interim status requirements of 40 CFR Part 266 Subpart H.
- The CD is an incinerator burning hazardous waste and has a final permit under 40 CFR Part 270 and complies with 40 CFR Part 264 Subpart O.
- The CD is an incinerator burning hazardous waste and has certified compliance with the interim status requirements of 40 CFR Part 265 Subpart O.

Temperature monitoring is required with a device capable of providing a continuous record. Monitor location requirements are shown in Table 9-3.

**Table 9-3  
Temperature Monitor Location  
Requirements**

CD	Monitor Location
Non-catalytic Incinerator	Firebox temperature or temperature in ductwork immediately downstream of firebox.
Catalytic Incinerator	Immediately before and after the catalyst bed.
Boiler or Process Heater <150 MBTU and Vent is Not Part of Primary Fuel	In firebox.

Exceptions:

The specified temperature monitoring is not required for the following”

- Only emissions from equipment leaks are combusted (See 9.9).
- The CD is a boiler or process heater and all vent streams are introduced as or with the primary fuel.

NOTE: In this case this emission may be subject to the “route to fuel gas” option requirements discussed in 9.7 instead of the requirements discussed in this section.

**9.12 Absorbers, Condensers, and Carbon Adsorbers (§63.990)**

Where absorbers, condensers, or carbon adsorbers are used to meet a weight percent reduction or a ppmv outlet requirement, §63.990 applies. Such CDs must be operated whenever emissions are routed to them.

NOTE: Only carbon adsorbers regenerated in situ are covered by §63.990.

Initial performance testing is required per the performance test provisions of §63.997 (see 9.18). SVs and LTTR may do a design evaluation instead, as discussed in 9.8.

Exceptions:

Design evaluations or performance tests are not required if:

- Only emissions from equipment leaks are controlled (See 9.9).
- A previous performance test was done meeting the requirements of §63.997(b) (See 9.18).

Monitoring is required with a device capable of providing a continuous record. Table 9-4 tabulates the monitoring required for these control device types.

**Table 9-4  
Required monitoring for Absorber,  
Condenser and Carbon Adsorber CDs**

CD	Monitor Requirements
Absorber	Scrubbing liquid temperature and specific gravity (s. g.). If the difference between the s. g. of the saturated scrubbing fluid and s. g. of the fresh scrubbing fluid is <0.02 s. g. units, an organic monitoring device shall be used.
Condenser	Product side exit temperature.
Carbon Adsorber	Integrating regeneration stream flow monitoring device having an accuracy of ±10 percent or better, capable of recording the total regeneration stream mass or volumetric flow for each regeneration cycle; and a carbon bed temperature monitoring device, capable of recording the carbon bed temperature after each regeneration and within 15 minutes of completing any cooling cycle.

Exceptions:

The specified monitoring is not required for absorbers, condensers and carbon adsorbers if only emissions from equipment leaks are controlled (See 9.9).

**9.13 Implementation and Enforcement (§63.992)**

Subpart SS enforcement and implementation may be delegated to state, local and tribal authorities.

Exception:

- Approval of alternatives to the nonopacity emissions standards in §§63.983(a) and (d), §63.984, §63.985(a), §63.986(a), §63.987(a), §63.988(a), §63.990(a), §63.993(a), §63.994(a), and §63.995(a) are retained by EPA and will not be delegated. Where Subpart SS references another subpart, the cited provisions will be delegated according to the delegation provisions of the referenced subpart.

**9.14 Absorbers, Condensers, and Carbon Adsorbers and Other Recovery Devices used as Final Recovery Devices (§63.993)**

The testing and monitoring requirements for recovery devices used to maintain a process vent above a TRE trigger are contained in this section. Since Ethylene MACT does not use the TRE approach, this option and §63.993 are not applicable to the ethylene production process.

**9.15 Halogen Scrubbers and Other Halogen Reduction Devices (§63.994)**

Since halogens are not prevalent in ethylene production processes, Ethylene MACT does not regulate halogenated vents and thus the provisions of Subpart SS dealing with halogens are not applicable to ethylene production processes.

**9.16 Other Control Devices (§63.995)**

Process vents and transfer racks may meet the percent reduction or ppmv outlet concentration requirement using devices other than incinerators, boilers, process heaters, absorbers, condensers or carbon adsorbers. §63.995 identifies requirements for such situations. Such CDs must be operated whenever regulated emissions are vented to them.

NOTE: Carbon adsorbers, which are not regenerated in place, would be considered “Other Control Devices” under Ethylene MACT.

An initial performance test is required for other CDs, following the performance test procedures from §63.997 (see 9.18).

The owner or operator must submit a description of planned monitoring, recordkeeping and reporting procedures as specified in a referencing subpart. The Administrator will approve, deny, or modify the proposal based on the reasonableness of the proposed monitoring, reporting and recordkeeping requirements as part of the review of the submission or permit application or by other appropriate means.

**9.17 General Monitoring Requirements for Control and Recovery Devices (§63.996)**

This section specifies general requirements for required continuous monitors. It replaces §63.8 of Subpart A, which does not apply to monitors required by Subpart SS.

Exceptions:

The following are not subject to monitoring requirements of this section

- Flare flame and pilot monitors.
- Flow indicators. (NOTE: Flow indicators are used for CVS bypass monitoring and are distinct from flow monitors, such as for carbon adsorber regeneration stream flow, which are not exempt from §63.996).

§63.996(c)(6) requires the establishment of a range of monitored parameters that indicates proper operation of the CD. The range may be based upon a prior performance test, or upon existing ranges, or limits established under a referencing subpart (i.e., Subpart YY). This parameter range will be the basis for ongoing compliance reporting and so must, along with supporting information (see Table 12-20), be submitted in the Notice of Compliance Status or via an operating permit application.

Other continuous monitor installation, operation and maintenance requirements in §63.996 are quite extensive and are not reviewed here (see §63.996(c)). Nor are the procedures in this section for alternate monitoring and revisions to monitoring, monitoring records and reports discussed. Alternate monitoring and use of alternative relative accuracy tests are also addressed in §63.1112(c) and (d) (see Section 2.7 of this manual).

**9.18 General Performance Test and Compliance Assessment Requirements for Control Devices (§63.997)**

Flare compliance assessment and nonflare CD performance test requirements are contained in §63.997. It replaces §63.7 of Subpart A, which does not apply to CDs required by Subpart SS. Flare compliance assessment requirements are incorporated into Appendix C of this manual. Detailed recordkeeping and reporting requirements are included in the Tables associated with Chapters 11 and 12. A few key items relative to performance tests are summarized below. Owners and operators planning performance tests should review §63.997 carefully, since it is somewhat different than and includes some flexibility not present in, the normal Part 63 performance test procedures of the Part 63 General Provisions (§63.7).

§63.1112(b) of Subpart YY includes provisions for obtaining a waiver from performance test requirements. Individual performance tests may be waived upon written application to the Administrator if, in the Administrator's judgment, the source is meeting the relevant standard(s) on a

continuous basis, or the source is being operated under an extension of compliance, or the owner or operator has requested an extension of compliance and the Administrator is still considering that request. Specifics of the request, including timing of the submission, are superseded by §63.997(b)(1) and §63.999(a)(1)(iii) of Subpart SS.

§63.997(b)(1) provides that, unless requested by the Administrator, an initial compliance assessment or performance test is not required if a prior test or assessment was conducted using the same methods and either no process changes have been made or the owner or operator can demonstrate that the prior test or assessment, with or without adjustments, reliably demonstrates compliance despite process changes. A written application to substitute a prior performance test or compliance assessment is required, as detailed in Table 12-25.

§63.997(c) of Subpart SS provides 180 days from the compliance date to complete initial performance tests and compliance assessments.

Performance tests are to be conducted at maximum representative operating conditions for the process, unless the Administrator specifies or approves alternate conditions. Additional performance test requirements apply and are not detailed here; please see §63.997 for details.

**9.19 Recordkeeping and Data Handling**  
(§63.998)

Records must be maintained as specified in §63.1109 of Subpart YY and must be readily available for inspection. Most records must be maintained for 5 years. These requirements are discussed in Chapter 11. Specific recordkeeping requirements associated with CVS and CD and other Subpart SS requirements are listed in the Tables included in Chapter 11. Data handling and compliance requirements from §63.998 are discussed below.

§63.998(b) specifies the requirements for records where Subpart SS requires a “continuous record.” Continuous record systems are required to make measurements at least every 15 minutes. You may:

- Record all measured values.
- Record block average values for 15-minute or shorter periods calculated from all measured data values during each period or from at least one measured value per minute if measured more frequently than once per minute.
- Where data is collected from an automated continuous parameter monitoring system (CPMS), the owner or operator may calculate and retain block hourly average values from each 15-minute block average period or from at least one measured value per minute if measured more frequently than once per minute, and discard all but the most recent three valid hours of continuous (15-minute or shorter) records, if the hourly averages do not exclude periods of CPMS breakdown or malfunction. An automated CPMS records the measured data and calculates the hourly averages through the use of a computerized data acquisition system.
- Records as required by an alternative approved under Subpart SS or YY.

Exceptions:

Certain data must be excluded from averages computed to determine compliance. The excluded data is that which is recorded during:

- Monitoring system breakdowns, repairs, preventive maintenance, calibration checks, and zero (low-level) and high-level adjustments;
- Periods of non-operation of the process unit (or portion thereof), resulting in cessation of the emissions to which the monitoring applies; and

- Start-ups, shutdowns, and malfunctions, if the owner or operator follows the applicable provisions of §63.1111 (see Chapter 10) and maintains the records required for such times.

Daily average values of each continuously monitored parameter must be calculated and recorded from the non-excluded data for each operating day and retained for 5 years. The daily average is calculated as the average of all values for a monitored parameter recorded during the operating day. The average covers a 24-hour period if operation is continuous, or the period of operation per operating day if operation is not continuous (e.g., for transfer racks the average shall cover periods of loading). If values are measured more frequently than once per minute, a single value for each minute may be used to calculate the daily average instead of all measured values. The operating day must be defined in the source operating permit or in the Notification of Compliance Status.

Exception:

- If all recorded values for a monitored parameter during an operating day are within the range established in the Notification of Compliance Status or in the operating permit, the owner or operator may record that all values were within the range and retain this record for 5 years rather than calculating and recording a daily average for that operating day. In such cases, the owner or operator may not discard the recorded values as otherwise allowed for automated CPMS.

§63.998(b)(5) provides for a specific alternative recordkeeping system, which does not require keeping the raw measured data for process vents or high throughput transfer racks, for continuous monitoring systems that meet certain design and performance requirements. Notification of a source's decision to use this alternative is required in the Notice of Compliance Status or in a periodic report. Specifics of this alternate are not included in this discussion or the Tables in Chapter 11.

§63.998(b)(6) identifies “excursions” as the daily average value of monitoring data for a parameter being greater than the maximum, or less than the minimum, established value. Unless excused, excursions are possible violations.

Exception:

- Daily average values outside the established range during any SS&M event is not an excursion if §63.1111 provisions are followed and the required SS&M records are maintained.

§63.999(c)(6)(i) of Subpart SS also defines certain lack of data events as excursions as follows:

- When the period of CD operation is 4 hours or greater in an operating day and monitoring data are insufficient to constitute a valid hour of data for at least 75 % of the operating hours.
- When the period of CD operation is less than 4 hours in an operating day and more than one of the hours during the period of operation does not constitute a valid hour of data due to insufficient monitoring data.

Monitoring data are insufficient to constitute a valid hour of data if measured values are unavailable for any of the 15-minute periods within the hour.

In evaluating whether an excursion is a violation, Subpart SS provides (in §63.998(b)(6)(ii)) for one excused excursion for each control device for each semiannual period. Events which occur during periods of non-operation of the ethylene process or a portion thereof resulting in the cessation of the emissions to which the monitor applies, are excursions but not violations and do not count as excused excursions.

**9.20 Reporting (§63.999)**

Specific notification and reporting requirements associated with CVS and CD and other Subpart SS requirements are included in Chapter 12.

# Ethylene MACT Compliance Manual

## Chapter 10

### Startup, Shutdown and Malfunction

#### Chapter 10 Index

- 10.1** *Overview*
- 10.2** *Structure of the Rule*
- 10.3** *Applicability and General Requirements*
- 10.4** *Definitions*
- 10.5** *Startup, Shutdown and Malfunction Plans*
- 10.6** *Recordkeeping*
- 10.7** *Reporting*

#### 10.1 Overview

Ethylene MACT requires control of a wide variety of emission sources in ethylene processes. However, except for emissions subject to BWON control requirements at facilities with a TAB  $\geq 10$  Mg/yr, the emission limitations are not applicable during periods of start-up, shutdown or malfunction (SS&M). During SS&M periods, the source is required to minimize emissions in accordance with §63.1111(a). Sources are also required to have a Startup, Shutdown and Malfunction Plan (SSMP). The requirement to follow the plan was removed by the amendments of April 20, 2006.

#### 10.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in §63.1103(e)(3) that ethylene processes must comply with the compliance provisions of §63.1108 and the SS&M provisions of §63.1111. Differences between the Ethylene MACT SS&M requirements and Part 63 General Provisions requirements are identified in the discussion in this chapter.

The detailed SS&M requirements are contained in §63.1111. The subsections of §63.1111 are:

63.1111(a) Startup, shutdown and malfunction plan

63.1111(b) Startup, shutdown and malfunction reporting requirements

#### 10.3 Applicability and General Requirements

Per §63.1108(a), the emission limitations and parameter limits of Ethylene MACT do not apply during periods of SS&M or during periods of non-operation that result in a cessation of Appendix D organic HAP emissions. Instead owners or operators of the ethylene production unit must implement, to the extent reasonably available, measures to prevent or minimize excess emissions, and comply with the requirements of §63.1111. §63.1108(a)(6) requires that malfunctions be corrected as soon as practical after they occur.

NOTE: If a period of SS&M or non-operation does not affect the ability of a particular emission point to comply with a specific provision to which it is subject, then that emission point must be operated in compliance with the Ethylene MACT during the period of SS&M or non-operation

For equipment subject to equipment leak requirements (see Chapter 5), the requirements of Ethylene MACT apply at all times except during periods of SS&M or non-operation in which lines are drained and depressurized resulting in cessation of Appendix D organic HAP emissions.



§63.1111(a) requires a written SSMP that describes, in detail, procedures for operating and maintaining the ethylene production unit during periods of SS&M. The plan is to include a program of corrective actions for malfunctioning process and air pollution control equipment that is used to comply with the Ethylene MACT. The plan also must address routine or predictable CPMS malfunctions.

NOTE: §63.1111(a)(2) states that excess emissions only must be reduced to the levels required by the Ethylene MACT for normal operations.

63.1111(a) states that the purpose of the SSMP is to ensure that owners or operators are prepared to correct malfunctions as soon as practical in order to minimize emissions and to reduce the reporting burden associated with periods of SSM.

The requirement to have a SSMP is to be incorporated in the source's Title V permit, but the plan itself is not part of the Title V permit and not subject to Title V revision procedures.

§63.1111(a) also states that the SSMP requirement is optional for equipment that must comply with the equipment leak requirements of Subpart UU (see Chapter 5). However, the SSMP is not optional for a CVS and CD used to transport and control equipment leak emissions and which is subject to Subpart SS.

NOTE: Use of a CVS and CD is one compliance option for certain equipment subject to Subpart UU (e.g., pump and compressor seals). When this option is elected, the SSMP provisions apply for the CVS and CD.

NOTE: At sites with a TAB  $\geq$ 10 Mg/yr, the general Ethylene MACT exception from emission limitations during periods of SS&M in §63.1108(a) does not apply, since the BWON regulation contains no SS&M provisions (though it contains other exemptions from control).

#### 10.4 Definitions (§63.1020)

Although the definitions of SS&M critical terms used in Ethylene MACT are similar to those in other MACT rules, there are differences in some cases and it is strongly recommended that persons who are accountable for writing Ethylene MACT SSMPs and for SS&M compliance carefully read the definitions provided in §63.1101, §63.1103(e)(2) and which are compiled in Appendix A of this manual.

NOTE: The definition of "malfunction" that applies for Ethylene MACT (from §63.1101) did not contain the excess emissions test until the amendments of April 20, 2006.

Appendix A of this manual tabulates all of the definitions applicable to the Ethylene MACT rule. The key definitions impacting SS&M are included here.

*Excess emissions* means emissions in excess of those that would have occurred if there were no start-up, shutdown, or malfunction and the owner or operator complied with the relevant provisions of [Subpart YY]. (§63.1101)

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded.. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. (§63.1101 - overrides definition in §63.2).

*Shutdown* means the cessation of operation of an affected source or equipment that is used to comply with [Subpart YY], or the emptying and degassing of a storage vessel. For the purposes of [Subpart YY], shutdown includes, but is not limited to, periodic maintenance, replacement of equipment, or repair. Shutdown does not include the routine rinsing or washing of equipment in batch operation between batches. Shutdown includes the decoking of ethylene production unit furnaces. (§63.1101 - overrides definition in §63.2.)

NOTE: Because furnace decoking is included in the definition of shutdown, that activity is subject to the SS&M provisions and procedures for addressing the requirements specified in §63.1111(a) (see section 10.3) during decoking should be included in the SSMP.

*Startup* means the setting into operation of a regulated source and/or equipment required or used to comply with [Subpart YY]. Startup includes initial startup, operation solely for testing equipment, the recharging of equipment in batch operation, and transitional conditions due to changes in product for flexible operation units. (§63.1101 - overrides definition in §63.2.)

*Start-up* means the setting into operation of a piece of equipment or a control device that is subject to [Subpart UU]. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Startup* means the setting in operation of a stationary source for any purpose. (§61.2 - Applies for Ethylene MACT waste and waste water that is subject to BWON.)

### **10.5 Startup, Shutdown and Malfunction Plan**

A written SSMP must be developed by ethylene production units. The plan must describe, in detail, the procedures for operating and maintaining the ethylene production unit during periods of SS&M. It must also include a program of corrective action for malfunctioning process and air pollution control equipment used for compliance.

§63.1108(a)(6) specifies that malfunctions must be corrected as soon as practical after their occurrence. The SSMP must also address routine or otherwise predictable continuous parameter monitor system (CPMS) malfunctions. During SS&M periods you must operate and maintain the ethylene production source and associated air pollution control equipment and CPMS in accordance with the §63.1111(a).

NOTE: The requirement to follow the plan was removed in the amendments of April 20, 2006. Instead you must meet the requirements of the §63.1111(a) to minimize emissions, etc.

Per §63.1103(e)(3), the SSMP must also address recordkeeping and reporting. Reporting requirements are specified in Subpart YY at §63.1111(b). See Section 10.7 of this chapter.

NOTE: Per §63.1108(a)(5), during SS&M the owner or operator must implement, to the extent reasonably available, measures to prevent or minimize excess emissions. The measures to be taken must be identified in the SSMP, and may include, but are not limited to, air pollution control technologies, recovery technologies, work practices, pollution prevention, monitoring, and/or changes in the manner of operation of the affected source. Back-up control devices are not required, but may be used if available.

Compliance with an inadequate SSMP is not a shield for failing to comply with good operation and maintenance requirements.

The SSMP must be complete by the Ethylene MACT compliance date (July 12, 2005 for existing sources).

You may use Standard Operating Procedures as your SS&M if they meet the SSMP content and other requirements and you make it available for inspection.

You must revise the SSMP if directed by the Administrator after a finding that the plan is inadequate (see §63.1111(a)(4)) or if a malfunction occurs that is not included in the plan or is inadequately addressed by the plan.

In the latter case revision of the SSMP is required within 45 days.

Unlike the Part 63 General Provisions, §63.1111 does not require maintaining superseded plans for five years or notifying the Administrator of changes to the SSMP. However, State and Local regulations and permit conditions may include these requirements.

#### **10.6 Recordkeeping (§63.1038)**

Per §63.1103(e)(3), SS&M recordkeeping is to be addressed in the SSMP. However, recordkeeping for SS&M associated with CVS and CD and associated CPMS is spelled out in Subpart SS and has been tabulated in Table 11-14 of Chapter 11.

Records for demonstrating that the SSMP was followed are not specified in the rule, but as a practical matter sources would need to have such records to support the reporting requirements of the regulation.

#### **10.7 Reporting (§63.1111(b))**

Two reports are required for SS&M activities. A semi-annual periodic report, which may be submitted with the Ethylene MACT periodic report, and an immediate SS&M report are required. The contents of these reports are tabulated in Tables 12-11 and 12-22 of Chapter 12, respectively.

#### Periodic Report

Reports are only required for SS&M events during which excess emissions occurred. If there are no such events during a semi-annual period, no SS&M report is required for that period.

A SS&M periodic report can be submitted as part of an Ethylene MACT periodic report (required under §63.1110(a)(5)), or on a more frequent basis if established otherwise by the permitting authority in the affected source's Title V permit. The SS&M report must be delivered or postmarked by the 30th day following the end of each calendar half (or other calendar reporting period, as appropriate), unless the information is submitted with the Ethylene MACT periodic report.

#### Immediate report

Any time an action taken during a SS&M event (including actions taken to correct a malfunction) during which excess emissions occur is not consistent with the procedures specified in the SSMP, the owner or operator must report the actions taken for that event within 2 working days after commencing actions inconsistent with the plan, followed by a letter delivered or postmarked within 7 working days after the end of the event.

Notwithstanding the immediate reporting requirements of the previous sentence, after the effective date of an approved permit program in the State in which an affected source is located, the owner or operator may make alternative reporting arrangements, in advance, with the permitting authority in that State. Procedures governing the arrangement of alternative reporting requirements under this paragraph are specified in §63.1110(h).

# Ethylene MACT Compliance Manual

## Chapter 11

### Compliance Records

#### Chapter 11 Index

*11.1 Overview*

*11.2 Structure of the rule*

*11.3 Applicability*

*11.4 Recordkeeping Requirements*

*11.5 Required Records*

#### 11.1 Overview

The owner or operator of an ethylene production unit is required to keep copies of notifications, reports and records that are required by the Ethylene MACT for 5 years, unless otherwise specified. The specific records to be maintained are specified in Subpart YY and in the subparts referenced by Subpart YY. The record requirements of Subpart YY and referenced subparts are tabulated, in detail, in this chapter.

Ethylene production units are also required to maintain records by §61.356 (BWON) as part of the requirements for the Ethylene MACT. Those BWON recordkeeping requirements are not described in this manual. However, the records added by the Ethylene MACT for continuous butadiene-containing waste streams and for wastes handled off-site are included.

NOTE: For ethylene production units at facilities with a TAB <10 Mg/yr, the BWON recordkeeping requirements apply to only the continuous butadiene streams and the limited number of benzene-containing streams addressed by Ethylene MACT,

#### 11.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in §63.1103(e)(3) that ethylene production units are required to comply with the recordkeeping requirements of §63.1109 of Subpart YY. The specific records to be

maintained are specified by other sections of Subpart YY and by the subparts applicable to ethylene production processes and referenced by Subpart YY. §63.998 in Subpart SS (National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process) also specifies additional requirements for the “continuous records” required by that subpart. See Chapter 9 Section 9.19 for those requirements.

The relevant paragraphs of §63.1109 discussed in this chapter are listed below.

§63.1109(a) Maintaining notifications, records, and reports

§63.1109(b) Copies of reports

§63.1109(c) Availability of records

§63.1109(a) Control applicability records

#### 11.3 Applicability

These recordkeeping requirements apply to ethylene production units that are required to comply with Part 63 Subpart YY, the Ethylene MACT.

#### 11.4 Recordkeeping Requirements (§63.1109)

Maintenance of Records: Keep copies of notifications, reports and records required by the Ethylene MACT (those required by Subpart YY or by subparts referenced by Subpart YY) for at least 5 years, unless otherwise specified.

Copies of Records: Paragraph §63.1110(g)(1) provides that the EPA regional Office may waive the requirement to submit a copy of any reports or notifications [send to the delegated authority] at its discretion.

Availability of Records: The most recent two years of required records shall be maintained such that they can be readily accessed and are suitable for inspection. The records for the remaining 3 years, where required, may be retained offsite. Records may be maintained in hard copy or computer-readable form including, but not limited to, on paper, microfilm, computer, computer disk, magnetic tape or microfiche.

Control Applicability: Owners or operators shall maintain records containing information developed and used to assess control applicability under §63.1103 (e.g., combined total annual emissions of Appendix D organic HAP). For Ethylene MACT, these are the applicability limits shown in Table 7 of §63.1103(e) and listed in Table 11-1.

**Table 11-1 Control Applicability for Ethylene MACT Requirements**

Source	Applicability Assessments
Storage vessels	<ol style="list-style-type: none"> <li>Total Appendix D organic HAP vapor pressure, and</li> <li>Vessel capacity</li> </ol>
Ethylene process vents	<ol style="list-style-type: none"> <li>Flow rate, and</li> <li>Total Appendix D organic HAP concentration</li> </ol>
Transfer Racks	<ol style="list-style-type: none"> <li>Total Appendix D organic HAP vapor pressure, and</li> <li>30-day average volume of Appendix D organic HAP-containing material loaded</li> </ol>
Equipment Leaks	<ol style="list-style-type: none"> <li>Appendix D organic HAP content (<math>\geq 5\%</math>), and</li> <li>Vacuum service as applicable</li> </ol>
Wastes	<ol style="list-style-type: none"> <li>Appendix D organic HAP content of wastewater, and</li> <li>Benzene and 1,3-Bd content of wastes.</li> </ol>
Heat Exchange Systems	None

**11.5 Required Records**

The following tables identify the specific records required by Ethylene MACT. Table 11-2 is an index of the tables that constitute the balance of this chapter.

**Table 11-2  
Index of Required Records**

Table	Subject
11-3	Applicability Records
11-4	Storage Tanks, Surge Control Vessels and Bottoms Receivers
11-5	Process Vents
11-6	Equipment Leaks
11-7	Transfer Racks
11-8	Waste Operations
11-9	Heat Exchange Systems
11-10	Closed Vent Systems
11-11	Control Device Compliance Monitoring Records
11-12	Other Control Device Compliance Records
11-13	CD Performance Tests and Compliance Assessments
11-14	SS&M Records



<b>Table 11-3 Applicability Records</b>	
<b>Citation</b>	<b>Record</b>
§63.1100(d)(4)	If the primary product is determined to be something other than [ethylene or propylene], retain information, data, and analyses used to document the basis for the determination that the primary product is not produced by [an ethylene production process].
§63.1(b)(3)	Ethylene production units that conclude they are not subject to the Ethylene MACT must keep a record of that conclusion.
§63.1103	Control applicability information as listed in Table 11-1 of Section 11-4 of this chapter or otherwise used in making control applicability decisions.

<b>Table 11-4 Storage Tank Compliance Records</b>	
<b>Citation</b>	<b>Record</b>
§63.1065	The owner or operator shall keep the records required in paragraph (a) of this section for as long as liquid is stored. Records required in paragraphs (b), (c) and (d) of this section shall be kept for at least 5 years. Records shall be kept in such a manner that they can be readily accessed within 24 hours. Records may be kept in hard copy or computer-readable form including, but not limited to, on paper, microfilm, computer, floppy disk, magnetic tape, or microfiche.
§63.1065(a)	<i>Vessel dimensions and capacity.</i> A record shall be kept of the dimensions of the storage vessel, an analysis of the capacity of the storage vessel, and an identification of the liquid stored.
§63.1065(b)	<i>Inspection results.</i> Records of floating roof inspection results shall be kept as specified in (b)(1) and (b)(2) below.
§63.1065(b)(1)	If the floating roof passes inspection, a record shall be kept that includes the information specified in (i) and (ii) below. If the floating roof fails inspection, a record shall be kept that includes the information specified in (i) through (b)(1)(v) below. (i) Identification of the storage vessel that was inspected. (ii) The date of the inspection. (iii) A description of all inspection failures. (iv) A description of all repairs and the dates they were made. (v) The date the storage vessel was removed from service, if applicable.
§63.1065(b)(2)	A record shall be kept of EFR seal gap measurements, including the raw data obtained and any calculations performed.

<b>Table 11-4 (Continued)</b> <b>Storage Tank Compliance Records</b>	
<b>Citation</b>	<b>Record</b>
§63.1065(c)	<i>Floating roof landings.</i> The owner or operator shall keep a record of the date when a floating roof is set on its legs or other support devices. The owner or operator shall also keep a record of the date when the roof was refloated, and the record shall indicate whether the process of refloating was continuous.
§63.1065(d)	An owner or operator who elects to use an extension in accordance with §63.1063(e)(2) or §63.1063(c)(2)(iv)(B) (see below) shall keep the documentation required by those paragraphs.
§63.1063(e)(2)	Documentation of a decision to use an extension shall include a description of the failure, shall document that alternate storage capacity is unavailable, and shall specify a schedule of actions that will ensure that the control equipment will be repaired or the vessel will be completely emptied as soon as practical.
§63.1063(c)(2)(iv)(B)	Documentation of a decision to use an extension shall include an explanation of why it was unsafe to perform the inspection, documentation that alternative storage capacity is unavailable, and a schedule of actions that will ensure that the vessel will be emptied as soon as practical.

<b>Table 11-5 Process Vent Compliance Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.1104(l)(1)	Data, assumptions, and procedures used in ethylene process vent engineering assessments.	
§63.1104(l)(2)	Measured flowrate or flowrate determined via engineering assessment.	
§63.1104(l)(3)	Measured Appendix D organic HAP or Appendix D organic HAP determined via engineering assessment.	
§63.1104(l)(4)	Record of any process change that changes the control applicability for an ethylene process vent.	Record must include any recalculation or measurement of the flowrate or Appendix D organic HAP concentration.

<b>Table 11-6 Equipment Leak Compliance Records (See Table 11-10 for CVS Monitoring Records)</b>	
<b>Citation</b>	<b>Record</b>
§63.1038(b)	<i>General equipment records.</i>
§63.1038(b)(1)	As specified in §63.1022(a) and (b), the owner or operator shall keep general and specific equipment identification if the equipment is not physically tagged and the owner or operator is electing to identify the equipment subject to [Subpart UU] through written documentation such as a log or other designation.
§63.1038(b)(2)	The owner or operator shall keep a written plan as specified in §63.1022(c)(4) for any equipment that is designated as unsafe- or difficult-to-monitor.
§63.1038(b)(3)	The owner or operator shall maintain a record of the identity and an explanation as specified in §63.1022(d)(2) for any equipment that is designated as unsafe-to-repair.
§63.1038(b)(4)	As specified in §63.1022(e), the owner or operator shall maintain the identity of compressors operating with an instrument reading of less than 500 parts per million.
§63.1038(b)(5)	The owner or operator shall keep records associated with the determination that equipment is in heavy liquid service as specified in §63.1022(f).
§63.1038(b)(6)	The owner or operator shall keep records for leaking equipment as specified in §63.1023(e)(2), as indicated below: 63.1023(e)(2) When each leak is detected, the information specified in §63.1024(f) (see below) shall be recorded and kept pursuant to [§63.1109 of Subpart YY], except for the information for connectors complying with the 8 year monitoring period allowed under §63.1027(b)(3)(iii) shall be kept 5 years beyond the date of its last use.



<b>Table 11-6 (continued)</b> <b>Equipment Leak Compliance Records</b>	
<b>Citation</b>	<b>Record</b>
§63.1038(b)(7)	<p>The owner or operator shall keep records for leak repair as specified in §63.1024(f) and records for delay of repair as specified in §63.1024(d).</p> <p>Leak repair records of §63.1024(f), for each leak, are:</p> <ul style="list-style-type: none"> <li>(1) The date of first attempt to repair the leak.</li> <li>(2) The date of successful repair of the leak.</li> <li>(3) Maximum instrument reading measured by Method 21 of 40 CFR Part 60, Appendix A at the time the leak is successfully repaired or determined to be nonrepairable.</li> <li>(4) “Repair delayed” and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak as specified in paragraphs (f)(4)(i) and (f)(4)(ii) of this section. <ul style="list-style-type: none"> <li>(i) The owner or operator may develop a written procedure that identifies the conditions that justify a delay of repair. The written procedures may be included as part of the startup, shutdown, and malfunction plan, as required by the referencing subpart for the source, or may be part of a separate document that is maintained at the plant site. In such cases, reasons for delay of repair may be documented by citing the relevant sections of the written procedure.</li> <li>(ii) If delay of repair was caused by depletion of stocked parts, there must be documentation that the spare parts were sufficiently stocked on-site before depletion and the reason for depletion.</li> </ul> </li> <li>(5) Dates of process unit or affected facility shutdowns that occur while the equipment is unrepaired.</li> </ul> <p>Delay of repair records as specified in §63.1024(d) are:</p> <p>The owner or operator shall maintain a record of the facts that explain any delay of repairs and, where appropriate, why the repair was technically infeasible without a process unit shutdown.</p>
§63.1038(c)	<i>Specific equipment leak records.</i>
§63.1038(c)(1)	<ul style="list-style-type: none"> <li>(1) For valves, the owner or operator shall maintain the records specified in paragraphs (c)(1)(i) and (c)(1)(ii) of this section. <ul style="list-style-type: none"> <li>(i) The monitoring schedule for each process unit as specified in §63.1025(b)(3)(vi).</li> <li>(ii) The valve subgrouping records specified in §63.1025(b)(4)(iv), if applicable, as follows: <ul style="list-style-type: none"> <li>(A) Which valves are assigned to each subgroup,</li> <li>(B) Monitoring results and calculations made for each subgroup for each monitoring period,</li> <li>(C) Which valves are reassigned, the last monitoring result prior to reassignment, and when they were reassigned, and</li> <li>(D) The results of the semiannual overall performance calculation required in paragraph (b)(4)(iii) of this section.</li> </ul> </li> </ul> </li> </ul>

<b>Table 11-6 (Continued)</b> <b>Equipment Leak Compliance Records</b>	
<b>Citation</b>	<b>Record</b>
§63.1038(c)	<i>Specific equipment leak records (Continued).</i>
§63.1038(c)(2)	<p>For pumps, the owner or operator shall maintain the records specified in paragraphs (c)(2)(i) through (c)(2)(iii) of this section.</p> <p>(i) Documentation of pump visual inspections as specified in §63.1026(b)(4).</p> <p>(ii) Documentation of dual mechanical seal pump visual inspections as specified in §63.1026(e)(1)(v).</p> <p>(iii) For the criteria as to the presence and frequency of drips for dual mechanical seal pumps, records of the design criteria and explanations and any changes and the reason for the changes, as specified in §63.1026(e)(1)(i), as follows:</p> <p>The owner or operator determines, based on design considerations and operating experience, criteria applicable to the presence and frequency of drips and to the sensor that indicates failure of the seal system, the barrier fluid system, or both. The owner or operator shall keep records at the plant of the design criteria and an explanation of the design criteria; and any changes to these criteria and the reasons for the changes. This record must be available for review by an inspector.</p>
§63.1038(c)(3)	<p>For connectors, the owner or operator shall maintain the monitoring schedule for each process unit as specified in §63.1027(b)(3)(v), as follows:</p> <p>The owner or operator shall keep a record of the start date and end date of each connector monitoring period for each process unit.</p>
§63.1038(c)(4)	<p>Documentation of agitator seal visual inspections as specified in §63.1028; and</p> <p>(ii) For the criteria as to the presence and frequency of drips for agitators, the owner or operator shall keep records of the design criteria and explanations and any changes and the reason for the changes, as specified in §63.1028(e)(1)(vi), as follows:</p> <p>The owner or operator shall keep records of the design criteria and an explanation of the design criteria; and any changes to these criteria and the reasons for the changes.</p>
§63.1038(c)(5)	<p>For pressure relief devices in gas and vapor or light liquid service, the owner or operator shall keep records of the dates and results of monitoring following a pressure release, as specified in §63.1030(c)(3).</p>
§63.1038(c)(6)	<p>For compressors, the owner or operator shall maintain the records specified in paragraphs (c)(6)(i) and (c)(6)(ii) of this section.</p> <p>(i) For criteria as to failure of the seal system and/or the barrier fluid system, record the design criteria and explanations and any changes and the reason for the changes, as specified in §63.1031(d)(2).</p> <p>(ii) For compressors operating under the alternative compressor standard, record the dates and results of each compliance test as specified in §63.1031(f)(2).</p>
§63.1038(c)(7)	Pump QIP records
§63.1038(c)(8)	Batch Process Unit alternative records
§63.1038(c)(9)	Enclosed-vented process unit alternative records

<b>Table 11-7 Transfer Rack Compliance Records</b>	
<b>Citation</b>	<b>Record</b>
§63. 1105 (i)	The verification of DOT tank certification or Method 27 of Appendix A to 40 CFR Part 60 testing required in §63.84(c) has been performed. Various methods for the record of verification can be used, such as a check-off on a log sheet, a list of DOT serial numbers or Method 27 data, or a position description for gate security showing that the security guard will not allow any trucks on-site that

<b>Table 11-8 Waste Operations Compliance Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
	The applicable records specified in 40 CFR Part 61 Subpart FF (BWON) are required as modified by Table 2 of Subpart XX. Table 2 specifies that §61.356(b)(2)(ii), and (b)(3) through (b)(5) of BWON do not apply for ethylene production processes at facilities with a TAB <10 MG. <u>The BWON records are not listed here.</u> The records listed below are required <u>in addition</u> to those required by BWON or are modified from BWON requirements.	For benzene waste streams.
§63.1095(a)(1)(iii)	Comply with the recordkeeping requirements in §61.356(b), (b)(1) and (b)(2), except substitute “1,3-butadiene” for each occurrence of “benzene” and “continuous butadiene waste stream” for each occurrence of “waste stream.”	If using the BWON compliance option for continuous butadiene streams.
§61.356(b) with revisions per §63.1095(a)(1)(iii) and Table 2 of Subpart XX.	Each owner or operator shall maintain records that identify each <b>continuous butadiene waste stream</b> at the facility subject to [Subpart FF], and indicate whether or not the <b>continuous butadiene waste stream</b> is controlled for <b>1,3-butadiene</b> emissions in accordance with [Subpart FF]. In addition the owner or operator shall maintain the following records:	
	(1) For each <b>continuous butadiene waste stream</b> not controlled for <b>1,3-butadiene</b> emissions in accordance with [Subpart FF], the records shall include all test results, measurements, calculations, and other documentation used to determine the following information for the <b>continuous butadiene waste stream</b> : <b>continuous butadiene waste stream</b> identification, water content, whether or not the <b>continuous butadiene waste stream</b> is a process wastewater stream, annual waste quantity, range of	

Table 11-8 (Continued) Waste Operations Compliance Records		
Citation	Record	Comments
	<b>1,3-butadiene</b> concentrations, and annual average flow-weighted <b>1,3-butadiene</b> concentration.	
	(2) For each <b>continuous butadiene waste stream</b> exempt from §61.342(c)(1) ( <i>i.e. exempt from the control requirements of BWON</i> ) in accordance with §61.342(c)(3) ( <i>i.e. de minimus flow</i> ), the records shall include:	
	(i) All measurements, calculations, and other documentation used to determine that the continuous flow of process wastewater is less than 0.02 liters (0.005 gallons) per minute, or ... ( <i>balance not applicable</i> )	
§63.1095(a)(2)	Comply with the applicable recordkeeping requirements for process wastewaters in Subpart G of Part 63 (HON).	If using the HON compliance option for continuous butadiene streams.

Table 11-9 Heat Exchange System Records		
Citation	Record	Comments
§63.1089(a)	Monitoring data that indicate a leak, the date the leak was detected or, if applicable, the basis for determining that there is no leak.	
§63.1089(b)	Dates of efforts to repair leaks.	
§63.1089(c)	The method or procedures used to confirm repair of a leak and the date the repair was confirmed.	
§63.1086(c)(3)	The current monitoring plan.	If using the surrogate parameter monitoring provision of §63.1086(c). Maintain on-site or such that it is accessible from a central location by computer or other means that provide access within 2 hours after a request.

<b>Table 11-9 (Continued)</b> <b>Heat Exchange System Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.1086(c)(3)	Most recently superseded monitoring plan.	If using the surrogate parameter monitoring provision of §63.1086(c). Maintain for 5 years on-site or such that it is accessible from a central location by computer or other means that provide access within 2 hours after a request.
§63.1088(b) and §63.1089(d)	Documentation of the determination that a shutdown for repair would cause greater emissions than the emissions likely to result from delay of repair. The documentation must include: <ul style="list-style-type: none"> <li>• State the reason(s) for delaying repair.</li> <li>• A schedule for completing the repair as soon as practical.</li> <li>• Calculation of the potential emissions from the leaking heat exchanger by multiplying the concentration of HAP listed in Table 8-1 (or other monitored substances) in the cooling water from the leaking heat exchanger by the flow rate of the cooling water from the leaking heat exchanger and by the expected duration of the delay.</li> <li>• A determination of the emissions of HAP listed in Table 8-1 (or other monitored substances) from purging and depressurizing the equipment that would have resulted from the unscheduled shutdown for repair.</li> </ul>	Record supporting a decision to delay repair of a leaking heat exchanger or heat exchange system because repair is technically infeasible without a shutdown and the shutdown would result in more emissions than will result from delay of repair.

<b>Table 11-9 (Continued)</b> <b>Heat Exchange System Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.1088(c) and §63.1089(d)	Record that the necessary parts, equipment or personnel were not available to allow repair of a leaking heat exchanger or heat exchange system without delay of repair.	Record supporting a decision to delay repair of a leaking heat exchanger or heat exchange system because repair is technically infeasible without a shutdown and necessary parts, equipment or personnel were not available.
§63.1089(e)	Record of validation of a method from 40 CFR Part 136, including test data and calculations (see Section 8.5 of this manual.)	

<b>Table 11-10</b> <b>Closed Vent System Compliance Records</b> <b>(These provisions do not apply to CVS handling <u>only</u> equipment leak emissions)</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.998(d)(1)(ii)(A)	Hourly records of whether each flow indicator was operating and whether any diversion was detected at any time during the hour. Also, records of all periods when the vent stream is diverted and when the flow indicator was not operating.	For bypasses with flow indicators.
§63.998(d)(1)(ii)(B)	Record that the monthly visual inspection has been done and a record of all periods when the seal mechanism is broken, the bypass line valve position has changed or the key for a lock and key type lock has been checked out and records of any car seal that has been broken.	For bypasses with car seals or key and lock devices.
§63.998(d)(1)(iv)	For each CVS inspection where no leak is detected, record the date of inspection and a statement that no leaks were detected.	

<p align="center"><b>Table 11-10 (Continued)</b>  <b>Closed Vent System Compliance Records</b>  <b>(These provisions do not apply to CVS handling <u>only</u> equipment leak emissions)</b></p>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.998(d)(1)(iii) (A)-(D)	If a leak is detected (per §63.983(d)(2)), record the instrument and equipment identification numbers and the name, initials or identification number of the operator. Record the date the leak was detected, the date of the first attempt to repair the leak and the date of successful repair. Record the maximum instrument reading measured after the leak is successfully repaired or determined to be “nonrepairable”.	
§63.998(d)(1)(iii)(E)	Record “repair delayed” and the reason for the delay if the leak is not repaired within 15 days. A written procedure that identifies the conditions that justify a delay of repair may be used. In such cases, reasons for delay of repair may be documented by citing the relevant sections of the written procedure.	For “nonrepairable” CVS equipment.
§63.998(d)(1)(iii)(F)	Copies of the applicable periodic reports.	If records are not maintained on a computerized database capable of generating summary reports from the records.
§63.983(b)(2), §63.998(d)(1)(i)	Identification of all CVS components that are designated as unsafe-to-inspect, an explanation as to why they are unsafe-to-inspect and the plan to inspect the equipment when it is safe.	Must require inspection when safe, but no more frequently than once per year.
§63.983(b)(3), §63.998(d)(1)(i)	Identification of all CVS components that are designated as difficult-to-inspect, an explanation as to why they are difficult-to-inspect and the plan to inspect the equipment required by §63.983(b)(2)(iii).	Must require inspection at least every 5 years.

<b>Table 11-11</b>		
<b>Control Device Compliance Monitoring Records</b>		
<b>(These provisions do not apply to CDs handling <u>only</u> equipment leak emissions)</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.998(d)(2)(i)	Record of the measured values for monitored parameters as specified in the monitoring plan.	For all SV and LTTR using nonflare CD. To demonstrate compliance with monitoring plan.
§63.998(a)(ii)	Hourly records of whether the monitor is continuously operating and whether the flare flame or at least one pilot flame is continuously present.	For flares. For transfer racks vents, hourly records are required only while the transfer rack vent stream is being vented.
§63.998(a)(iii)(A)	The times and duration of all periods during which the flare flame or all the pilot flames are absent.	For flares.
§63.998(a)(iii)(B)	The times and durations of all periods during which the pilot or flame monitor is not operating.	For flares.
§63.998(b)(1)(i)-(iv), (c)(2)(i), (c)(3)(i)	Raw continuous monitor data and/or averages as specified in §63.998(b)(1). See Section 9.19 for summary.	For nonflare CD continuous monitors where continuous records are required.
§63.998(b)(3), (c)(2)(ii), (c)(3)(ii)	Daily averages of monitored parameters as specified in §63.998(b)(3). See Section 9.19 for summary. For catalytic incinerators, record the daily average temperature upstream of the catalyst bed and the daily average of the temperature differential across the bed.	For nonflare CD continuous monitors where continuous records are required, except carbon adsorbers.
§63.998(b)(3), (c)(3)(ii)(A) and (B)	Records of the total regeneration stream mass or volumetric flow for each carbon bed regeneration cycle and of the temperature of the carbon bed after each regeneration and within 15 minutes of completing any cooling cycle.	For carbon adsorbers used as a CD.



<b>Table 11-11 (Continued)</b>		
<b>Control Device Compliance Monitoring Records</b>		
<b>(These provisions do not apply to CDs handling <u>only</u> equipment leak emissions)</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.998(b)(5)	Records required under the §63.998(b)(5) alternate recordkeeping system, in place of the raw data and daily average records specified above, if that alternate is being used.	For nonflare CD continuous monitors used for process vents and high throughput transfer racks, where continuous records are required.
§63.998(b)(7), (c)(2)(iii), (c)(3)(iii)	Records of periods when parameter boundaries are exceeded as specified in §63.998(b)(7), including information for such events which are not excursions because of SS&M activity that was handled in compliance with the SS&M requirements. See Section 9.19 for summary.	For nonflare CD continuous monitors where continuous records are required.
§63.998(d)(5)	Record the occurrence and cause of periods when monitored parameters are outside the ranges documented in the NOCS.	
§63.998(c)(1)(i)	Procedure used for calibrating each continuous parameter monitor (CPMS).	
§63.998(c)(1)(ii)(A)	The date and time of completion of calibration and preventive maintenance of each CPMS.	
§63.998(c)(1)(ii)(B)	The “as found” and “as left” CPMS readings, whenever an adjustment is made that affects the CPMS reading and a “no adjustment” statement otherwise.	
§63.998(c)(1)(ii)(C)	The start time and duration or start and stop times of any periods when the CPMS is inoperative.	
§63.998(c)(1)(ii)(H)	Records of the total duration of each CPMS operating time.	

<b>Table 11-12 Other Control Device Compliance Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.984(b)(3)	Design evaluation for storage vessel streams routed to process	Documents that process meets one of the conditions of §63.894(b)(2).
§63.998(d)(2)(ii)(A)-(C)	Planned routine maintenance records for CDs used for storage vessels. Record the time and date the CD requirements of Subpart SS were not met and then when they were met at the conclusion of the planned routine maintenance and a description of the maintenance performed.	
§63.998(d)(4)(i)	Detailed schematics, design specifications of the control device, and piping and instrumentation diagrams. The dates and descriptions of any changes in the design specifications. A description of the parameter or parameters monitored, as required in §63.1034(b) to ensure that CD are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected.	For CVS and CD handling <u>only</u> equipment leak emissions.  Must be kept for the life of the CVS or CD.
§63.998(d)(4)(ii)(A), (B)	Dates and durations when the CVS or CD is not operating as indicated by the monitored parameters. Dates and durations when the monitoring system or devices are not operating.	For CVS and CD handling <u>only</u> equipment leak emissions.

<b>Table 11-13 Control Device Performance Test and Compliance Assessment Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.998(a)(1)(i)(A)	Flare design (i.e., steam assisted, air assisted, non-assisted).	For flare compliance assessments.
§63.998(a)(1)(i)(B)	All visible emission readings, heat content determinations, flow rate measurements, and exit velocity determinations.	For flare compliance assessments.
§63.998(a)(1)(i)(C)	All periods during the flare compliance assessment when all pilot flames are absent or, if only the flare flame is monitored, all periods when the flare flame is absent.	For flare compliance assessments.
§63.998(a)(2)(ii)(B)(1)	The fire box temperature averaged over the full period of the performance test.	For thermal incinerators demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(B)(2)	The upstream and downstream temperatures and the temperature difference across the catalyst bed averaged over the full period of the performance test.	For catalytic incinerators demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(B)(4)	The percent reduction of Appendix D organic HAP, if applicable, or TOC achieved by the incinerator determined as specified in §63.997(e)(2)(iv), as applicable, or the concentration of Appendix D organic HAP (parts per million by volume, by compound) determined as specified in §63.997(e)(2)(iii) at the outlet of the incinerator.	For an incinerator demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(B)(3)	The fire box temperature averaged over the full period of the performance test.	For boiler or process heater of <150 MBTU/hr where the vent stream is not introduced with or as the primary fuel and demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(B)(5)	A description of the location at which the vent stream is introduced into the boiler or process heater.	For boiler or process heater demonstrating compliance with the percent reduction or ppmv requirement.

<b>Table 11-13 (Continued)</b>		
<b>Control Device Performance Test and Compliance Assessment Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.998(a)(2)(ii)(B)(6)	The percent reduction of Appendix D organic HAP or TOC, or the concentration of Appendix D organic HAP or TOC (ppmv, by compound) determined as specified in §63.997(e)(2)(iii) at the outlet of the combustion device.	For boiler or process heater of <150 MBTU/hr where the vent stream is not introduced with or as the primary fuel and demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(C) (1), (4)	The exit specific gravity and average exit temperature of the absorbing liquid or the concentration level or reading indicated by an organics monitoring device at the outlet of the absorber averaged over the same time period as the performance test (both measured while the vent stream is normally routed and constituted).	For absorber demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(C) (2), (4)	The average exit (product side) temperature or the concentration level or reading indicated by an organics monitoring device at the outlet of the condenser averaged over the same time period as the performance test while the vent stream is routed and constituted normally.	For condenser demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(C) (3), (4)	The total regeneration stream mass flow during each carbon-bed regeneration cycle during the period of the performance test, and the temperature of the carbon-bed after each regeneration during the period of the performance test (and within 15 minutes of completion of any cooling cycle or cycles, or the concentration level or reading indicated by an organics monitoring device at the outlet of the carbon adsorber averaged over the same time period as the performance test while the vent stream is normally routed and constituted.	For carbon absorber demonstrating compliance with the percent reduction or ppmv requirement.
§63.998(a)(2)(ii)(C)(5)	The percent reduction of Appendix D organic HAP achieved by the CD or concentration of Appendix D organic HAP (ppmv, by compound) at the outlet of the absorber, condenser or carbon absorber.	For absorber, condenser or carbon absorber demonstrating compliance with the percent reduction or ppmv requirement.

<b>Table 11-14 SS&amp;M Compliance Records</b>		
<b>Citation</b>	<b>Record</b>	<b>Comments</b>
§63.1103(e)(3)	SS&M recordkeeping is to be addressed in the SSMP. However, recordkeeping for SS&M associated with CVS and CD and associated CPMS is spelled out in Subpart SS and has been tabulated below.	
§63.998(b)(7), (c)(2)(iii), (c)(3)(iii)	Records of periods when parameter boundaries are exceeded as specified in §63.998(b)(7), including information for such events which are not excursions because of SS&M activity that was handled in compliance with the SS&M requirements. See Section 9.19 for a summary.	For nonflare CD continuous monitors where continuous records are required.
§63.998(c)(1)(ii) (D)	Records of the occurrence and duration of each SS&M of each CPMS during which excess emissions as defined in a §63.1111 occur.	
§63.998(c)(1)(ii) (E)	For each SS&M during which excess emissions as defined in §63.1111 occurs, records whether the procedures specified in the source's SSMP were followed, and documentation of actions taken that are not consistent with the plan. These records may take the form of a "checklist," or other form of recordkeeping that confirms conformance with the SSMP for the event.	For a continuous parameter monitors used for compliance.
§63.998(c)(1)(ii) (F)	Records documenting each SS&M.	For a continuous parameter monitors used for compliance.
§63.998(c)(1)(ii) (G)	Records of each CPMS SS&M event that specify that there were no excess emissions during the event, as applicable.	For a continuous parameter monitors used for compliance.
§63.998(c)(1)(ii) (H)	Records of the total duration of operating time.	For a continuous parameter monitors used for compliance.
§63.998(d)(3)(i)	Records of the occurrence and duration of each SS&M during which excess emissions occur.	For process equipment or control equipment used for compliance.
§63.998(d)(3)(ii)	For each SS&M during which excess emissions occur, records that the procedures in the source's SSMP were followed and documentation of action taken that are not consistent with the plan. The records may take the form of a checklist.	For process equipment or control equipment used for compliance.
§63.998(d)(4)(ii) (C)	Dates and durations of startups and shutdowns of CD.	For CD handling <u>only</u> equipment leak emissions.

# Ethylene MACT Compliance Manual

## Chapter 12

### Compliance Reporting

#### Chapter 12 Index

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#### 12.1 Overview

The owner or operator of an ethylene production unit is required to submit the reports described in this chapter. These reports include an initial notification, notice of compliance status (NOCS), periodic reports, applications for approval of construction or reconstruction, initial startup notifications, startup, shutdown and malfunction (SSM) reports, and other reports specific to the requirements described in the other chapters of this manual. The other chapters discuss some of the data that is required to be included in the reports. This chapter includes a tabulation of required content.

Ethylene production units are also required to submit additional reports per §61.357 (BWON), covering benzene-containing wastes, as part of the requirements for the Ethylene MACT. Those BWON reporting requirements are not described in this chapter and are not modified by Ethylene MACT. Additional reports, following BWON content requirements, required for 1,3-butadiene-containing wastes are discussed herein.

#### 12.2 Structure of the Rule

Subpart YY, the Generic MACT standard, specifies in §63.1103(e)(3) that ethylene production units are required to comply with the reporting requirements of §63.1110 of Subpart YY. The specific data or information to be included in the reports is specified in sections of Subpart YY and in the Part 63 subparts applicable to ethylene production processes that are referenced by Subpart YY. In addition, the General Provisions in §63.5 of Part 63 require an application for pre-approval of construction or reconstruction. The relevant paragraphs of Subpart YY are listed below:

§63.1110(a) Required Reports

§63.1110(b) Notification of initial startup

§63.1110(c) Initial Notification

§63.1110(d) Notification of Compliance Status

§63.1110(e) Periodic Reports

§63.1110(f) General Report Content

§63.1110(g) Report and notification submission

§63.1110(h) Adjustment to timing of submittals and review of required communications.

**12.3 Applicability**

These reporting requirements apply to ethylene production units that are required to comply with Subpart YY, the Generic MACT.

Overlap with Title V reports:

Information that is required by Subpart YY, which is submitted with a Title V periodic report, need not also be included in a subsequent periodic report required by Subpart YY or a subpart referenced by Subpart YY. That is, data submitted in a Title V report does not need to be repeated in the periodic reports described in this chapter. The Title V report must, however, be referenced in the periodic report required by Subpart YY (see §63.1110(e)(3)).

**12.4 Definitions**

Applicable definitions can be found in Appendix A of this manual. Three of these, of particular importance to the reporting requirements, from Part 63 Subpart A (General Provisions) are repeated here.

- *Existing source* means any affected source that is not a new source.
- *New source* means any affected source the construction or reconstruction of which is commenced after the Administrator first proposes a relevant emission standard under this part establishing an emission standard applicable to such source. (Since the Ethylene MACT was first proposed on 12/6/00, a new ethylene production unit is one for which construction or reconstruction commenced after 12/6/00.)
- *Reconstruction*, unless otherwise defined in a relevant standard, means the replacement of components of an affected or a previously nonaffected source to such an extent that:
  - The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source; and

- It is technologically and economically feasible for the reconstructed source to meet the relevant standard(s) established by the Administrator (or a State) pursuant to Section 112 of the Act.

Upon reconstruction, an affected source, or a stationary source that becomes an affected source, is subject to relevant standards for new sources, including compliance dates, irrespective of any change in emissions of hazardous air pollutants from that source.

**12.5 Timing of Reports**

Some important events and the reporting dates for existing ethylene units are shown in Table 12-1. For the report timing for new units refer to §63.1110 in Subpart YY. The proposal date, effective date, and compliance date are specified in Subpart YY at §63.1102(a). The dates for the reports are specified in Subpart YY at §63.1110

**Table 12-1  
Report Timing for Existing Units**

Date	Event or Report
12/6/00	Proposal Date of Ethylene MACT.
7/12/02	Effective Date of Ethylene MACT.
7/12/03	Submit Initial Notification (Due 1 year from the date the unit becomes subject to Subpart YY.)
7/12/05	Compliance Date (3 yrs after the Effective Date.)
3/9/06 (or 60 days after the initial PT and CA completed, if earlier.)	Submit the NOCS (Due 240 days after the Compliance Date or 60 days after completion of the initial performance (PT) tests and compliance assessments (CA), which ever is earlier.)

**Table 12-1 (Continued)  
Report Timing for Existing Units**

Date	Event or Report
9/9/06 (or 6 months after the date NOCS submitted, if earlier.)	End of 1 <sup>st</sup> 6-month period (6 months after the date the NOCS is submitted.)
11/30/06 (or end of month that includes date 60 days after the end of the 1 <sup>st</sup> period, if earlier.)	Submit 1 <sup>st</sup> periodic report (due last day of month that includes the date 60 days after the end of the 1 <sup>st</sup> 6-month period.)
60 days after the end of each 6-month period.	Submit subsequent periodic reports.

§63.1(a)(11) and (12) and §63.1110(h) provide additional information on due dates for recurring reports and procedures and for changing due dates. Specifically, if an explicit postmark deadline is not specified for the submittal of a notification, application, test plan, report, or other written communication to the Administrator, the owner or operator shall postmark the submittal on or before the number of days specified in the requirement. For example, if a notification must be submitted 15 days before a particular event is scheduled to take place, the notification shall be postmarked on or before 15 days preceding the event; likewise, if a notification must be submitted 15 days after a particular event takes place, the notification shall be postmarked on or before 15 days following the end of the event.

The use of reliable non-Government mail carriers that provide indications of verifiable delivery of information required to be submitted to the Administrator, similar to the postmark provided by the U.S. Postal Service, or alternative means of delivery, agreed to by the permitting authority, is acceptable.

Notwithstanding time periods or postmark deadlines for the submittal of information to the Administrator by an owner or operator, or the review of such information by the Administrator, such time periods or deadlines may be changed by mutual agreement between the owner or operator and the Administrator. Procedures governing the implementation of this provision are specified in §63.1110(h) (See Section 12.15 of this chapter).

**12.6 Initial Notification (§63.1110(c))**

Owners or operators of ethylene production units who are subject to Subpart YY are required to notify EPA by submitting an Initial Notification. For existing sources, the notification is due 12 months after the unit becomes subject to Subpart YY (July 12, 2003 for existing units.) For new units, the application for approval of construction or reconstruction required under §63.5(d) of Part 63 Subpart A may be used to fulfill the initial notification requirements. The notice shall include the following information:

- Identification of the storage vessels subject to this subpart.
- Identification of the process vents subject to this subpart.
- Identification of the transfer racks subject to this subpart.
- For equipment leaks, identification of the process units subject to this subpart.
- Identification of other equipment or emission points subject to this subpart.
- As an alternative for storage vessels, process vents and equipment leaks, process units can be identified instead of individual pieces of equipment. For this alternative, the kinds of emission points in the process unit that will comply must also be identified.



### 12.7 Notification of Compliance Status (§63.1110(d))

A Notification of Compliance Status (NOCS) report for each ethylene production unit that is subject Subpart YY is required.

The NOCS is due 240 days after the compliance date or 60 days after completion of the initial performance tests and initial compliance assessments, whichever is earlier. For existing Ethylene MACT sources, the NOCS is due no later than 3/9/06. Alternatively, this information can be submitted as part of a Title V permit application or amendment.

NOTE: Where multiple performance tests and/or compliance assessments are required, the 60 day period begins with completion of the last test.

NOCS reports may be combined for multiple affected sources as long as the due date requirements for all sources covered in the combined report are met.

The NOCS shall contain the following information.

- The Notification of Compliance Status shall include a statement from the owner or operator identifying which subpart he or she has elected to comply with, where given a choice, as provided for in §63.1100(g). (These are options that may apply when there is overlap with the requirements of the Ethylene MACT with other regulations. See Table 2-1 in Chapter 2 and the overlap descriptions in the applicability sections of Chapters 3 – 9 of this manual.)
- The Notification of Compliance Status shall include the information specified in Subpart YY and the subparts referenced by Subpart YY. The required information from the referenced subparts is listed in tables in Section 12-16 of this chapter.

### 12.8 Periodic Reports (§63.1110(e))

Semiannual reports are required. Except for the first report, these reports are due 60 days after the end of each 6-month period.

The first report shall cover the 6-month period after the NOCS report is due. The first report shall be submitted no later than the last day of the month that includes the date 8 months (6 months and 60 days) after the NOCS report is due. For ethylene units that submitted the NOCS on March 9, 2006, the first report is due on November 30, 2006.

Periodic Reports shall include all information specified in Subpart YY and subparts referenced by Subpart YY. This information is listed in the tables in Section 12-16 of this chapter.

NOTE: A periodic report is also required by the BWON rule for benzene-containing wastes and waste management units. Its content and schedule are not discussed in detail in this manual.

### 12.9 Application for Approval to Construct or Reconstruct (§63.1110(a)(6) and §63.5(d))

The General Provisions of Part 63 at §63.5(c)(3) require that after the effective date of any relevant standard (in this case July 12, 2002 for ethylene units subject to Subpart YY) no person may, without obtaining written approval in advance from the Administrator in accordance with the procedures specified in paragraphs (d) and (e) of §63.5, do any of the following:

- Construct a new affected source that is major-emitting and subject to such standard;
- Reconstruct an affected source that is major-emitting and subject to such standard; or
- Reconstruct a major source such that the source becomes an affected source that is major-emitting and subject to the standard.

The Part 63 General Provisions at §63.5(d) and (e) describe the requirements for the application for advanced approval of construction or reconstruction. The application must be submitted as soon as practical before construction begins. Owners or operators planning construction or reconstruction of an ethylene production unit should refer the requirements in §63.5 for instructions on submitting this application. Table 12-21 summarizes application content requirements.

**12.10 Notification of Initial Startup**  
(§63.1110(b))

Unless submitted under §63.5 (see Section 12.9 above) the owner or operator of an ethylene production unit that is a new source subject to Subpart YY, shall send a written notice to EPA of the actual date of initial startup of the unit. This applies to ethylene units for which construction or reconstruction commenced after December 6, 2000.

**12.11 Startup, Shutdown, and Malfunction Reports** (§63.1110(a)(7))

Requirements for startup, shutdown and malfunction (SSM) are described in Chapter 10 of this manual. SSM reporting requirements are tabulated in Tables 12-11 and 12-22 of this chapter.

**12.12 Other Reports** (§63.1110(a)(8))

In some cases other notifications and reports are required as described in Chapters 3 through 10 of this manual. These are tabulated in the tables in Section 12.16 of this chapter.

**12.13 General Report Content**  
(§63.1110(f))

All reports must include the following information.

- The name, address and telephone number (fax number may also be provided) of the owner or operator.
- The name, address and telephone number of the person to whom inquiries

should be addressed, if different than the owner or operator.

- The address (physical location) of the reporting facility.
- Identification of each ethylene process unit covered in the submission and identification of the subparts (Subpart YY and the subparts referenced by Subpart YY) that are applicable to that affected source. Summaries and groupings of this information are permitted. For ethylene production units, the list of subparts will typically be as indicated in Table 12-2.

**Table 12-2 40 CFR Part 63 Subparts<sup>1</sup> Applicable to Ethylene Production Units**

<b>40 CFR Part 63 Subpart</b>	<b>Description</b>
A	General Provisions
YY	Generic MACT
WW	Storage
SS	CVS and CD
UU	Equipment Leaks
XX	Heat Exchange Systems and Waste Operations

<sup>1</sup> 40 CFR Part 61 Subpart FF (BWON) is also applicable.

**12.14 Report and Notification Submission**  
(§63.1110)(g)

- All reports and notifications required by Subpart YY shall be sent to the appropriate EPA Regional Office and to the delegated State authority, except that request for permission to use an alternative means of emission limitation as provided for in §63.1113 shall be submitted to the Director of the EPA Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, MD-10, Research Triangle Park, North Carolina, 27711.
- The EPA Regional Office may waive the requirement to submit a copy of any reports or notifications at its discretion.

- *Submission of copies.* If any State requires a notice that contains all the information required in a report or notification listed in Subpart YY, an owner or operator may send the appropriate EPA Regional Office a copy of the report or notification sent to the State to satisfy the requirements of Subpart YY for that report or notification.
- *Method of submission.* Wherever Subpart YY specifies “postmark” dates, submittals may be sent by methods other than the U.S. Mail (e.g., by fax or courier). Submittals shall be sent on or before the specified date.
- *Submission by electronic media.* If acceptable to both the Administrator and the owner or operator of an affected source, reports may be submitted on electronic media.

**12.15 Adjustment to Timing of Submittals and Review of Required Communications (§63.1110)(h)**

Alignment with Title V submission. An owner or operator may submit Periodic Reports required by Subpart YY on the same schedule as the Title V periodic report for the facility. The owner or operator using this option need not obtain prior approval, but must ensure that no reporting gaps occur. The owner or operator shall clearly identify the change in reporting schedule in the first report filed under this provision. The general information requirements described in Section 12.13 of this chapter are not waived when implementing this change.

Establishment of a common schedule. An owner or operator may arrange by mutual agreement (which may be a standing agreement) with the Administrator a common schedule on which periodic reports required by Subpart YY shall be submitted throughout the year as long as the reporting period is not extended. Procedures governing the implementation of this provision are specified in §63.1110. Owners or operators desiring to establish such common schedules should refer to §63.1110(h)(3)-(7).

**12.16 Required Data for Reporting**

The chapters of this manual specify the reporting elements to be included in the reports described in this chapter. The actual data content requirements are listed in Tables 12-4 through 12-26 at end of this chapter and indexed in Table 12-3.



**Table 12-3 Index of Required Reports and Notifications**

<b>Table</b>	<b>Subject</b>
12-4	Periodic Report Content - Floating Roof Storage
12-5	Periodic Report Content - Process Vents
12-6	Periodic Report Content - Equipment Leaks
12-7	Periodic Report Content - Transfer Operations
12-8	Periodic Report Content - Waste Operations
12-9	Periodic Report Content - Heat Exchange Systems
12-10	Periodic Report Content - CVS and CD Monitoring
12-11	SS&M Periodic Report
12-12	Initial Notice Content
12-13	NOCS Report Content - Applicability
12-14	NOCS Report Content – Floating Roof Storage Tanks
12-15	NOCS Report Content – Process Vents
12-16	NOCS Report Content – Equipment Leaks
12-17	NOCS Report Content – Transfer Operations
12-18	NOCS Report Content – Waste Operations
12-19	NOCS Report Content – Heat Exchange Systems
12-20	NOCS Report Content – Control Devices
12-21	Application for Approval to Construct or Reconstruct
12-22	Immediate SS&M Reports
12-23	Other Floating Roof Tank Reports
12-24	Other Equipment Leak Reports
12-25	Other CVS and CD Reports
12-26	Process Vent Process Change Notice
12-27	Annual Report for Continuous Butadiene Wastewater Streams and Ethylene Processes at Facilities with a TAB <10 Mg/yr

<b>Table 12-4</b> <b>Periodic Report Content - Floating Roof Storage</b>	
<b>Citation</b>	<b>Content</b>
There are no required periodic reports storage tanks, surge control vessels or bottoms receivers controlled with floating roofs.	

<b>Table 12-5</b> <b>Periodic Report Content – Process Vents</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.1105(m) (2)(iii)	If a process change occurs, but no additional process vent control requirements are triggered as a result, include a statement to that effect in the next periodic report after the change.	

<b>Table 12-6</b> <b>Periodic Report Content – Equipment Leaks</b>	
<b>Citation</b>	<b>Content</b>
§63.1039(b)(1)	<p>For the equipment specified in paragraphs (b)(1)(i) through (b)(1)(v) of this section, report in a summary format by equipment type, the number of components for which leaks were detected and for valves, pumps and connectors show the percent leakers, and the total number of components monitored. Also include the number of leaking components that were not repaired as required by §63.1024, and for valves and connectors, identify the number of components that are determined by §63.1025(c)(3) to be nonrepairable.</p> <p>(i) Valves in gas and vapor service and in light liquid service pursuant to §63.1025(b) and (c).</p> <p>(ii) Pumps in light liquid service pursuant to §63.1026(b) and (c).</p> <p>(iii) Connectors in gas and vapor service and in light liquid service pursuant to §63.1027(b) and (c).</p> <p>(iv) Agitators in gas and vapor service and in light liquid service pursuant to §63.1028(c).</p> <p>(v) Compressors pursuant to §63.1031(d).</p>
§63.1039(b)(2)	Where any delay of repair is utilized pursuant to §63.1024(d), report that delay of repair has occurred and report the number of instances of delay of repair.

<b>Table 12-6 (Continued)</b> <b>Periodic Report Content – Equipment Leaks</b>	
<b>Citation</b>	<b>Content</b>
§63.1039(b)(3)	If applicable, report the valve subgrouping information specified in §63.1025(b)(4)(vi). (A) Total number of valves in each subgroup, and (B) Results of the semiannual overall performance calculation required by paragraph (b)(4)(iii).
§63.1039(b)(4)	For pressure relief devices in gas and vapor service pursuant to §63.1030(b) and for compressors pursuant to §63.1031(f) that are to be operated at a leak detection instrument reading of less than 500 parts per million, report the results of all monitoring to show compliance conducted within the semiannual reporting period.
§63.1039(b)(5)	Report, if applicable, the initiation of a monthly monitoring program for valves pursuant to §63.1025(b)(3)(i). (Monthly monitoring is required if the leak rate is 2% of greater.)
§63.1039(b)(6)	Report, if applicable, the initiation of a quality improvement program for pumps pursuant to §63.1035
§63.1039(b)(7)	Where the alternative means of emissions limitation for batch processes is utilized, report the information listed in §63.1036(f).
§63.1039(b)(8)	Report the information listed in [§63.1039(a)] for the Initial Compliance Status Report (NOCS) for process units or affected facilities with later compliance dates (see Table 12-16.) Report any revisions to items reported in an earlier Initial Compliance Status Report if the method of compliance has changed since the last report.

<b>Table 12-7</b> <b>Periodic Report Content – Transfer Operations</b>	
<b>Citation</b>	<b>Content</b>
There are no required periodic reports for transfer operations	

<b>Table 12-8</b> <b>Periodic Report Content – Wastes</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
	Nothing is required in the semi-annual Ethylene MACT periodic report for wastes. At facilities with a TAB ≥10 Mg/yr the applicable reports specified in Part 61 Subpart FF (BWON) continue to be required and are unchanged, in content or timing, by Ethylene MACT. See Table 12-27 for information on the separate annual waste report for certain benzene streams from ethylene processes at ethylene process units located at facilities with a TAB of less than 10 Mg/yr and for continuous butadiene streams at all ethylene processes.	

<b>Table 12-9</b> <b>Periodic Report Content – Heat Exchange Systems</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.1090	Report for leaks involving delay of repair: (a) The fact that a leak was detected, and the date that the leak was detected. (b) Whether or not the leak has been repaired. (c) The reasons for delay of repair. If you delayed the repair as provided in §63.1088(b), documentation of emissions estimates. (d) If a leak remains unrepaired, the expected date of repair. (e) If a leak is repaired, the date the leak was successfully repaired.	No reports are required unless you delay repair for your heat exchange system, then you must report the delay of repair in the semiannual report. If the leak remains unrepaired, you must continue to report the delay of repair in semiannual reports until you repair the leak.

<b>Table 12-10</b> <b>Periodic Report Content – CVS and Control Device Monitoring</b> <b>(These reports are not required for Control Devices handling <u>only</u> equipment leak emissions)</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.999(c)(1)	The reporting period dates and the total ethylene production unit operating time for the reporting period.	
§63.999(c)(2)(i)	The information recorded under §63.998(d)(1)(iii)(B) through (E). See Table 11-10 Closed Vent System Records for a list of these records.	For CVS systems subject to §63.983.
§63.999(c)(2)(ii)	Reports of the times of all periods recorded under §63.998(d)(1)(ii)(A) when the vent stream is diverted from the CD through a bypass line. See Table 11-10 Closed Vent System Records for a list of these records.	For CVS systems subject to §63.983.
§63.999(c)(2)(iii)	Reports of all times recorded under §63.998(d)(1)(ii)(B) when maintenance is performed on car-sealed valves, when the seal is broken, when the bypass line valve position is changed, or the key for a lock-and-key type configuration has been checked out. See Table 11-10 Closed Vent System Records for a list of these records.	For CVS systems subject to §63.983.

<p align="center"><b>Table 12-10 (Continued)</b>  <b>Periodic Report Content – CVS and Control Device Monitoring</b>  <b>(These reports are not required for Control Devices handling <u>only</u> equipment leak emissions)</b></p>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.999(c)(3)	The times and durations of all periods during which all pilot flames were absent or the flare flame was absent.	For flares.
§63.999(c)(4)(i)	For the 6-month period covered by the periodic report, the planned routine maintenance information recorded in §63.998(d)(2)(ii)(A) through (C). See Table 11-12 Other Control Device Records for a list of these records.	For storage vessels using a CVS and CD for compliance.
§63.999(c)(4)(ii)	For the time period covered by the periodic report and the previous periodic report, the total number of hours that the control system did not meet the requirements of §§63.983(a), §63.985(a), or §63.987(a) due to planned routine maintenance.	For storage vessels using a CVS and CD for compliance.
§63.999(c)(4)(iii)	A description of the planned routine maintenance during the next 6-month periodic reporting period that is anticipated to be performed for the control system when it is not expected to meet the required control efficiency. This description shall include the type of maintenance necessary, planned frequency of maintenance, and expected lengths of maintenance periods.	For storage vessels using a CVS and CD for compliance.
§63.999(c)(5)	Describe each occurrence when the monitored parameters were outside of the parameter ranges documented in the NOCS. Include identification of the CD and the cause of the excursion.	For storage vessels and low throughput transfer racks using a nonflare CD for compliance.



<b>Table 12-10 (Continued)</b> <b>Periodic Report Content – CVS and Control Device Monitoring</b> <b>(These reports are not required for Control Devices handling <u>only</u> equipment leak emissions)</b>		
Citation	Content	Comments
§63.999(c)(6)(i)	Include the daily average values of monitored parameters, calculated as specified in §63.998(b)(3)(i) (see Section 9.19) for any days when the daily average value is outside the bounds as defined in §63.998(c)(2)(iii) or (c)(3)(iii), or the data availability requirements defined in paragraphs (c)(6)(i)(A) through (D) of this section are not met, whether these excursions are excused or unexcused excursions. For excursions caused by lack of monitoring data, the duration of periods when monitoring data were not collected shall be specified. An excursion means any of the cases listed in paragraphs §63.999(c)(6)(i)(A) through (C) (see Section 9.19 for a discussion of excursions.) If the owner or operator elects not to retain the daily average values pursuant to §63.998(b)(5)(ii)(A), the owner or operator shall report this.	For process vents and transfer racks controlled with a nonflare CD. May or may not apply to storage vessels and low throughput transfer racks*.
§63.999(c)(6)(ii)	Report all carbon-bed regeneration cycles during which the parameters recorded under §63.998(a)(2)(ii)(C) were outside the ranges established in the NOCS or in the operating permit.	For process vents and transfer racks controlled with carbon adsorption. May or may not apply to storage vessels and low throughput transfer racks*.
§63.998(b)(5) and §63.999(c)(6)(iv)	Notification of decision to use the alternative continuous monitoring system provision. Include the information specified in §63.998(b)(5)(ii).	If not included in NOCS. Must be submitted in periodic report prior to implementing. For process vents and transfer racks controlled with nonflare CD. May or may not apply to storage vessels and low throughput transfer racks*.

\*Per §63.999(b)(2)(iv) and (c)(6)(iii), the provisions of §63.999(c)(6) do not apply to any LTTR for which the owner or operator has elected to comply with §63.985 or to any storage vessel for which the owner or operator is not required, by the applicable monitoring plan established under §63.985(c)(1), to keep continuous records. If continuous records are required, the owner or operator shall specify in the monitoring plan whether the provisions of paragraph §63.999(c)(6) apply.

<p align="center"><b>Table 12-11</b>  <b>SS&amp;M Periodic Report</b>  <b>(This report is separate from the normal periodic report, but if desired may be submitted with that report. The report is only required for SS&amp;M events during which there were excess emissions. If there were no such events in a period, no report is required.)</b></p>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.1111(b)(1)	If actions taken during a SS&M of the ethylene unit or of a control device or monitoring system required for compliance (including actions taken to correct a malfunction) are consistent with the procedures specified in the SSMP, state that in the SSMP report.	
§63.1111(b)(1)(i)	The name, title, and signature of the owner or operator or other responsible official certifying its accuracy.	
§63.1111(b)(1)(ii)	The number of SS&M events and the total duration of all periods of SS&M for the reporting period.	Not required if the total duration of periods of malfunctioning of a CPMS is <5% of that CPMS operating time for the reporting period and the total duration of periods of SS&M for an affected source is <1 % of that affected source's operating time for the reporting period.
§63.1111(b)(1)(iii)	Records documenting each CPMS SS&M event as required under §63.998(c)(1)(ii)(F). See Table 11-14.	
§63.1111(b)(1)(iv)	Records documenting the total duration of operating time as required under §63.998(c)(1)(ii)(H). See Table 11-14.	

<b>Table 12-12 Initial Notification Content</b>	
<b>Applicability Information</b>	
Citation	Content
§63.1110(c)(2)*	(2) Identification of the storage vessels subject to this subpart.
§63.1110(c)(3)*	(3) Identification of the process vents subject to this subpart.
§63.1110(c)(4)	(4) Identification of the transfer racks subject to this subpart.
§63.1110(c)(5)*	(5) For equipment leaks, identification of the process units subject to this subpart.
§63.1110(c)(6)	(6) Identification of other equipment or emission points subject to this subpart.
<b>Floating Roof Storage</b>	
Citation	Content
§63.1066(a)(1)	The identification of each storage vessel, its capacity and the liquid stored in the storage vessel.
§63.1066(a)(2)	A statement of whether the owner or operator of the source can achieve compliance by the compliance date specified in referencing subpart.
<b>Waste Operations</b>	
§61.357(a) as modified by §63.1095 and Table 2 of Subpart XX	Each owner or operator of an <b>ethylene production unit that is required to comply with Subpart XX</b> , and any facility managing wastes from these industries shall submit to the Administrator <b>as part of the initial notification</b> , or by the initial startup for a new source with an initial startup after November 12, 2002, a report that summarizes the regulatory status of each <b>continuous butadiene waste stream</b> subject to §61.342 ( <i>the BWON general standard</i> ) and is determined by the procedures specified in §61.355(c) ( <i>BWON test methods</i> ) to contain <b>1,3-butadiene</b> . Each owner or operator subject to this subpart who has no <b>1,3-butadiene</b> onsite in wastes, products, by-products, or intermediates shall submit an initial report that is a statement to this effect. For all other owners or operators subject to this subpart, the report shall include the following information:

\*As an alternative to the requirements specified in §63.1110(c)(1) through (3) and (c)(5), process units can be identified instead of individual pieces of equipment. For this alternative, the kind of emission point in the process unit that will comply must also be identified.

<b>Table 12-12 (Continued) Initial Notification Content</b>	
§61.357(a)(1)	Not applicable
§61.357(a)(2)	A table identifying each <b>continuous butadiene waste stream</b> and whether or not the <b>continuous butadiene waste stream</b> will be controlled for <b>1,3-butadiene</b> emissions in accordance with the requirements of [Subpart FF].
§61.357(a)(3)	For each <b>continuous butadiene waste stream</b> identified as not being controlled for <b>1,3-butadiene</b> emissions in accordance with the requirements of [Subpart FF] the following information shall be added to the table: (iii) Annual waste quantity for the <b>continuous butadiene waste stream</b> ; (iv) Range of <b>1,3-butadiene</b> concentrations for the <b>continuous butadiene waste stream</b> ; (v) Annual average flow-weighted benzene concentration for the <b>continuous butadiene waste stream</b> .

<b>Table 12-13 Notice of Compliance Status (NOCS) Content – Applicability</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.1100(d)(4)(i)	Identify product produced by process subject to Subpart YY	§63.1100(d)(4)(ii) contains reporting requirements for flexible operations units.
§63.1100(g)	Where Subpart YY allows an owner or operator an option to comply with one or another regulation, identify which regulation will be used for compliance.	
§63.5(d)(1)(iii)	An owner or operator who submits estimates or preliminary information in place of the actual emissions data and analysis required in an application for approval to construct must submit the actual, measured emissions data and other correct information as soon as available but no later than with the NOCS.	

<b>Table 12-14 Notice of Compliance Status (NOCS) Content – Floating Roof Storage Tanks</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
There are no NOCS requirements for floating roof storage tanks.		

<b>Table 12-15</b> <b>Notice of Compliance Status (NOCS) Content – Process Vents</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.1104(l)(2)	Measured flowrate or flowrate determined via engineering assessment.	Not required for Group 1 process vents.
§63.1104(l)(3)	Measured Appendix D organic HAP or Appendix D organic HAP determined via engineering assessment.	Not required for Group 1 process vents.

<b>Table 12-16</b> <b>Notice of Compliance Status (NOCS) Content – Equipment Leaks</b>	
<b>Citation</b>	<b>Content</b>
§63.1039(a)(1)	<p>The NOCS shall provide the information listed in paragraphs (a)(1)(i) through (a)(1)(iv) of this section for each process unit or affected facility subject to the requirements of [Subpart UU].</p> <p>(i) Process unit or affected facility identification.</p> <p>(ii) Number of each equipment type (e.g., valves, pumps) excluding equipment in vacuum service.</p> <p>(iii) Method of compliance with the standard (e.g., “monthly leak detection and repair” or “equipped with dual mechanical seals”).</p> <p>(iv) Planned schedule for requirements in §§63.1025 (for valves) and §63.1026 (for pumps) See Sections 5.9 and 5.10 of this manual.</p>
§63.1039(a)(2)	Notifications relating to batch processes
§63.1039(a)(3)	Notifications relating to enclosed-vented process unit alternative

<b>Table 12-17</b> <b>Notice of Compliance Status (NOCS) Content – Transfer Operations</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
There are no NOCS requirements for transfer operations.		

<b>Table 12-18</b> <b>Notice of Compliance Status (NOCS) Content – Waste Operations</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§61.357 (d)(1) as modified by Table 2 of Subpart XX	Submit as part of the Notification of Compliance Status, or by the date of initial startup for a new source with an initial startup after the effective date, a certification that the equipment necessary to comply with these standards has been installed and that the required initial inspections or tests have been carried out in accordance with [Subpart FF]. If a waiver of compliance is granted under §61.11, the certification of equipment necessary to comply with these standards shall be submitted by the date the waiver of compliance expires.	

<b>Table 12-19</b> <b>Notice of Compliance Status (NOCS) Content – Heat Exchange Systems</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
There are no NOCS requirements for heat exchange systems.		

<b>Table 12-20</b>		
<b>Notice of Compliance Status (NOCS) Content – Control Devices</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.999(a)(2)	Performance test and compliance assessment reports.	See the end of this table for specific content details.
§63.984(b)(3) and §63.999(b)(1)(i)	Design evaluation for storage vessels streams routed to process.	Documents that process meets one of the conditions of §63.894(b)(2).
§63.984(c) and §63.999(b)(1)(ii)	Statement of connection for storage vessel streams routed to fuel gas systems.	Must also indicate if conveyance system is a CVS and subject to §63.983.
§63.984(c) and §63.999(b)(1)(iii)	Statement of connection for transfer rack streams routed to fuel gas systems or process.	
§63.985(c)(1) and §63.999(b)(2)(i), (iv)	A description of the parameter or parameters to be monitored to ensure that the control device is being properly operated and maintained, an explanation of the criteria used for selection of that parameter (or parameters), and the frequency with which monitoring will be performed (e.g., when the liquid level in the storage vessel is being raised). If continuous records are specified, indicate whether the monitoring provisions of §63.999(c)(6) apply. See Section 9.19 for a discussion of the (c)(6) data availability requirements.	Required for all storage vessels and low throughput transfer racks using a nonflare CD.
§63.985(c)(1) and §63.999(b)(2)(ii)	The operating range for each monitoring parameter identified in the monitoring plan required by §63.985(c)(1). The specified operating range shall represent the conditions for which the control device is being properly operated and maintained.	Required for all storage vessels and low throughput transfer racks using a nonflare CD.

<b>Table 12-20 (Continued)</b>		
<b>Notice of Compliance Status (NOCS) Content – Control Devices</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.985(c)(1) and §63.999(b)(2)(ii)	The documentation specified in §63.985(b)(1)(i), if the owner or operator elects to prepare a design evaluation.	Required for all storage vessels and low throughput transfer racks using a nonflare CD and using a design evaluation to demonstrate initial compliance.
§63.999(b)(2)(v)	A summary of the results of the performance test described in §63.985(b)(1)(ii). If such a performance test is conducted, submit the results of the performance test, including the information specified in §63.999(a)(2)(ii) and (iii) (See the end of this table for specific content details.)	Required for all storage vessels and low throughput transfer racks using a nonflare CD and using a performance test to demonstrate initial compliance.
§63.999(b)(2)(vi)	If submitting performance test results from a shared control device, identify the storage vessel or low throughput transfer rack and CD and identify the emission points that share the CD.	Required for all storage vessels and low throughput transfer racks using a shared nonflare CD and using a performance test to demonstrate initial compliance.
§63.999(b)(3)	Submit operating range(s) for each monitoring parameter identified for each CD as determined pursuant to §63.996(c)(6). The specified operating range shall represent the conditions for which the CD is being properly operated and maintained. This report shall include, as applicable: The specific range of the monitored parameter(s) for each emission point; The rationale for the specific range for each parameter for each emission point, including any data and calculations used to develop the range and a description of why the range indicates proper operation of the CD, as follows, as applicable.	Required for all nonflare CD continuous monitors used for process vents and transfer racks (except low throughput transfer racks.)  The parameter range may be defined in the source Title V permit instead.



<b>Table 12-20 (Continued)</b>		
<b>Notice of Compliance Status (NOCS) Content – Control Devices</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
	<ul style="list-style-type: none"> <li>• If a performance test is required, the range shall be based on the parameter values measured during the performance test and may be supplemented by engineering assessments and/or manufacturer's recommendations. Performance testing is not required to be conducted over the entire range of permitted parameter values.</li> <li>• If a performance test is not required, the range may be based solely on engineering assessments and/or manufacturer's recommendations.</li> <li>• The range may be based on ranges or limits previously established under Subpart YY.</li> </ul>	
§63.998(b)(3)(i)(B) and §63.999(b)(3)(iii)	Designation of the time period that defines “an operating day” for continuous monitor compliance averages.	May be defined in the source operating permit instead.
§63.998(b)(5) and §63.999(b)(5)	Notification of a decision to use the alternative continuous monitoring system provision. Include the information specified in §63.998(b)(5)(ii).	

<b>Table 12-20 (Continued)</b>		
<b>Notice of Compliance Status (NOCS) Content – Control Devices</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
(§63.999(a)(1)(i)).	<i>The following reports are to be included with the Notice of Compliance Status for initial performance and compliance tests and are due 60 days after completing otherwise</i>	
§63.999(a)(2)(i) and (ii)	Include one complete test report as specified in §63.999(a)(2)(ii) for each test method used for a particular kind of emission point. For additional tests performed for the same kind of emission point using the same method, the results and any other information required shall be submitted, but a complete test report is not required.	A complete test report shall include a brief process description, sampling site description, description of sampling and analysis procedures and any modifications to standard procedures, quality assurance procedures, record of operating conditions during the test, record of preparation of standards, record of calibrations, raw data sheets for field sampling, raw data sheets for field and laboratory analyses, documentation of calculations, and any other information required by the test method.
§63.999(a)(2)(iii)(A)	The information recorded per §63.998(a)(1)(i). See Table 11-13 Control Device Performance Test and Compliance Assessment Records.	For flare compliance assessments
§63.999(a)(2)(iii)(B)	The information recorded per §63.998(a)(2)(ii)(B). See Table 11-13 Control Device Performance Test and Compliance Assessment Records.	For incinerator, boiler, process heater performance tests.
§63.999(a)(2)(iii)(B)	The information recorded per §63.998(a)(2)(ii)(C). See Table 11-13 Control Device Performance Test and Compliance Assessment Records.	For absorber, condenser, carbon adsorber performance tests.

<b>Table 12-21</b>		
<b>Application for Approval to Construct or Reconstruct*</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.5(d)(1)(ii)	<p>The applicant's name and address;</p> <p>A notification of intention to construct a new major ethylene production affected source or make any physical or operational change to a major affected source that may meet or has been determined to meet the criteria for a reconstruction, as defined in §63.2 or in Subpart YY;</p> <p>The address (i.e., physical location) or proposed address of the source;</p> <p>An identification of the relevant standard that is the basis of the application;</p> <p>The expected date of the beginning of actual construction or reconstruction;</p> <p>The expected completion date of the construction or reconstruction;</p> <p>The type and quantity of HAP emitted by the source, reported in units and averaging times and in accordance with the test methods specified in the Ethylene MACT, or if actual emissions data are not yet available, an estimate of the type and quantity of HAP expected to be emitted. The owner or operator may submit percent reduction information if the Ethylene MACT requirement is established in terms of percent reduction. However, operating parameters, such as flow rate, shall be included in the submission to the extent that they demonstrate performance and compliance.</p>	<p>The application must be submitted as soon as practicable before actual construction or reconstruction begins.</p> <p>Preconstruction review procedures that a State utilizes for other purposes may also be utilized for this application if the procedures are substantially equivalent to those specified. The Administrator will approve an application for construction or reconstruction specified in paragraphs §63.5(b)(3) and (d) of if the owner or operator of a new or reconstructed ethylene production affected source, who is subject to such requirement meets the following conditions:</p> <p>The owner or operator of the new or reconstructed ethylene production affected source has undergone a preconstruction review and approval process in the State in which the source is (or would be) located and has received a federally enforceable construction permit that contains a finding that the source will meet the Ethylene MACT, if the source is properly built and operated.</p> <p>Provide a statement from the State or other evidence (such as State regulations) that it considered the factors specified in §63.5(e)(1).</p>

\* Required for the construction or reconstruction of an ethylene production source that is major emitting and for reconstruction of a major source such that the source becomes an ethylene production affected source that is major emitting and subject to Ethylene MACT. New or reconstructed ethylene production affected sourced that are not major emitting but subject to Ethylene MACT must notify the Administrator of the intended construction or reconstruction using the procedures in §63.9(b).

<b>Table 12-21 (Continued)</b>		
<b>Application for Approval to Construct or Reconstruct*</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.5(d)(2)	<p>For construction, include:</p> <ol style="list-style-type: none"> <li>1. Technical information describing the proposed nature, size, design, operating design capacity, and method of operation of the source, including an identification of each type of emission point for each type of hazardous air pollutant that is emitted (or could reasonably be anticipated to be emitted) and a description of the planned air pollution control system (equipment or method) for each emission point.</li> <li>2. The description of the equipment to be used for the control of emissions must include each control device for each hazardous air pollutant and the estimated control efficiency (percent) for each control device.</li> <li>3. The description of the method to be used for the control of emissions must include an estimated control efficiency (percent) for that method.</li> <li>4. Such technical information must include calculations of emission estimates in sufficient detail to permit assessment of the validity of the calculations.</li> </ol>	

<b>Table 12-21 (Continued)</b>		
<b>Application for Approval to Construct or Reconstruct*</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.5(d)(3)	<p>For reconstruction include:</p> <ol style="list-style-type: none"> <li>1. A brief description of the ethylene production source and the components that are to be replaced;</li> <li>2. A description of present and proposed emission control systems (i.e., equipment or methods). The description of the equipment to be used for the control of emissions shall include each control device for each hazardous air pollutant and the estimated control efficiency (percent) for each control device. The description of the method to be used for the control of emissions shall include an estimated control efficiency (percent) for that method. Such technical information shall include calculations of emission estimates in sufficient detail to permit assessment of the validity of the calculations;</li> <li>3. An estimate of the fixed capital cost of the replacements and of constructing a comparable entirely new source;</li> <li>4. The estimated life of the ethylene production affected source after the replacements; and</li> <li>5. A discussion of any economic or technical limitations the source may have in complying with relevant standards or other requirements after the proposed replacements. The discussion shall be sufficiently detailed to demonstrate to the Administrator's satisfaction that the technical or economic limitations affect the source's ability to comply with the Ethylene MACT and how they do so.</li> </ol> <p>If in the application for approval of reconstruction the owner or operator designates the affected source as a reconstructed source and declares that there are no economic or technical limitations to prevent the source from complying with all relevant standards or other requirements, the owner or operator need not submit the information required in 3 or 5.</p>	

<b>Table 12-22 Immediate SS&amp;M Report</b>	
<b>Citation</b>	<b>Content</b>
§63.1111(b)(2)	Name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy.
§63.1111(b)(2)	Explanation of the circumstances of the event.
§63.1111(b)(2)	The reasons for not following the SSMP.
§63.1111(b)(2)	Whether any excess emissions and/or parameter monitoring exceedances are believed to have occurred.

<b>Table 12-23 Other Floating Roof Tank Reports</b>	
<b>Citation</b>	<b>Content</b>
§63.1066(b)(1)	<i>Notification of inspection.</i> To provide the Administrator the opportunity to have an observer present, the owner or operator shall notify the Administrator at least 30 days before an inspection required by §§63.1063(d)(1) or (d)(3). If an inspection is unplanned and the owner or operator could not have known about the inspection 30 days in advance, then the owner or operator shall notify the Administrator at least 7 days before the inspection. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, the notification including the written documentation may be made in writing and sent so that it is received by the Administrator at least 7 days before the inspection. If a delegated State or local agency is notified, the owner or operator is not required to notify the Administrator. A delegated State or local agency may waive the requirement for notification of inspections.
§63.1066(b)(2)	<i>Inspection results.</i> The owner or operator shall submit a copy of the inspection record (required in §63.1065) when inspection failures occur.
§63.1066(b)(3)	<i>Requests for alternate devices.</i> The owner or operator requesting the use of an alternate control device shall submit a written application including emissions test results and an analysis demonstrating that the alternate device has an emission factor that is less than or equal to the device specified in §63.1063.
§63.1066(b)(4)	<i>Requests for extensions.</i> An owner or operator who elects to use an extension in accordance with §63.1063(e)(2) (additional time to repair defects) or §63.1063(c)(2)(iv)(B) (additional time to remove EFR tank from service after determining the roof as unsafe to inspect) shall submit the documentation required by those paragraphs.

<b>Table 12-24 Other Equipment Leak Reports</b>	
<b>Citation</b>	<b>Content</b>
§63.1025(b)(v)	The owner or operator shall notify the Administrator no later than 30 days prior to the beginning of the next monitoring period of the decision to subgroup valves. The notification shall identify the participating process units and the number of valves assigned to each subgroup, if applicable, and may be included in the next Periodic Report.

<b>Table 12-25 Other CVS and CD Reports</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.997(c)(3) and §63.999(c)(7)	Notice of change in control device	Only required if source is not subject to Title V. Notice must be made before instituting change. Notice may be included in periodic report.
§63.999(a)(1)(i)	Notice of intent to conduct a performance test or flare compliance test.	Due at least 30 days before the test. Paragraph also has provisions for handling delays.
§63.1104(m)(2)(ii)	Notice of intent to conduct performance test or flare compliance test due to a process change which caused an ethylene process vent to require control.	Include statement in §63.999(a)(1)(i) notice above, that test is due to process change that caused a process vent to require control.
§63.995(c)	Submission for approval. Description of planned monitoring, recordkeeping and reporting procedures for a process vent or transfer alternate CD.	May be handled through permit application or other appropriate means.

<b>Table 12-25 (Continued) Other CVS and CD Reports</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.997(b)(1) and §63.999(a)(1)(v)	Submission for approval. Substitution of prior performance test or compliance assessment for an Ethylene MACT initial compliance assessment or performance test. The application for substitution shall include information demonstrating that the prior performance test or compliance assessment was conducted using the same methods specified in §63.997(e) or §63.987(b)(3), as applicable. The application shall also include information demonstrating that no process changes have been made since the test, or that the results of the performance test or compliance assessment reliably demonstrate compliance despite process changes.	Due 90 days before test deadline.
§63.997(b)(1) and §63.999(a)(1)(iii)	Submission for approval. Waiver of performance test or compliance assessment. The application for a waiver shall include information justifying the owner or operator's request for a waiver, such as the technical or economic infeasibility, or the impracticality, of the source performing the test.	Due 90 days before test deadline.
§63.999(d)(1) and §63.1112(c)(4) or (d)(2)	Submission for approval of alternates to monitoring and recordkeeping provisions. Include a description of the proposed alternative system and information justifying the request for an alternative method, such as the technical or economic infeasibility, or the impracticality, of the regulated source using the required method.	Submission schedule and procedures are specified in Subpart YY.



<b>Table 12-25 (Continued) Other CVS and CD Reports</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.999(d)(2) and §63.1112(c)(4)	Submission for approval to monitor a different parameter. Include a description of the parameter(s) to be monitored to ensure the control technology or pollution prevention measure is operated in conformance with its design and achieves the specified emission limit, percent reduction, or nominal efficiency, and an explanation of the criteria used to select the parameter(s); a description of the methods and procedures that will be used to demonstrate that the parameter indicates proper operation of the CD, the schedule for this demonstration, and a statement that the owner or operator will establish a range for the monitored parameter(s) as part of the NOCS if required, unless this information has already been submitted; and the frequency and content of monitoring, recording, and reporting, if monitoring and recording is not continuous, or if reports of daily average values when the monitored parameter value is outside the established range will not be included in periodic reports. The rationale for the proposed monitoring, recording, and reporting system shall also be included.	Submission schedule and procedures are specified in Subpart YY.
§63.1112(c)(6)	Submission for approval to use alternative to relative accuracy test.	Submission schedule and procedures are specified in Subpart YY.

<b>Table 12-26 Process Vent Process Change Report</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§63.1104(m)(2)	<p>Report that an ethylene process vent has become subject to control requirements because of a process change. Including:</p> <ul style="list-style-type: none"> <li>• A description of the process change.</li> <li>• Results of the measurement or reassessment of the flowrate and/or Appendix D organic HAP concentration.</li> <li>• A statement that the owner or operator will comply with the control requirements by the date required. (NOTE: §63.1104 does not specify the date by which compliance is required, but EPA staff indicate they read the regulation to require compliance upon startup of the process change..)</li> </ul>	<p>§63.1104(2)(i) requires this report 60 days after the performance test or applicability assessment that determines that the ethylene process vent has become subject to control requirements. The second sentence of that paragraph provides that the report may be submitted in the next periodic report. However, EPA staff indicate the periodic report may only be used if it is submitted within the 60 day window.</p>

<b>Table 12-27</b>		
<b>Annual Report for Benzene Streams at Ethylene Processes at Facilities with a TAB &lt;10 Mg/yr and for Continuous Butadiene Wastewater Streams at all Ethylene Processes*</b>		
<b>Citation</b>	<b>Content</b>	<b>Comments</b>
§61.357(d)(2) and §63.1095(a)(iv) and Table 2 of Subpart XX	<p>Beginning on the date that the equipment necessary to comply with these standards has been certified in the NOCS, the owner or operator shall <u>submit annually</u> to the Administrator a report that updates the information listed in §61.357(a)(2) through (a)(3) of Subpart FF. If the information in the annual report required by paragraphs (a)(2) through (a)(3) of this section is not changed in the following year, the owner or operator may submit a statement to that effect.</p> <p>§63.1095(a)(1)(v) specifies only the information in §61.357(a)(2) and (a)(3)(iii) through (v) is to be included in this report for continuous butadiene streams.</p> <p>Table 2 of Subpart XX specifies this report only must address spent caustic, dilution steam blowdown and continuous butadiene waste streams for ethylene production processes at sites with a TAB &lt;10 MG.</p> <p><i>See Waste Operations NOCS requirements for Waste Operations in this chapter for details of the required data for §61.375(a).</i></p>	New <u>annual</u> report required by Table 2 of Subpart XX for ethylene production processes at facilities with a TAB <10 MG.
Part 63 Subpart XX Table 2	§61.357(d)(3) through (d)(5) do not apply to ethylene production processes at facilities with a TAB <10 MG.	For benzene waste streams at facilities with a TAB <10 MG.

\* See Section 7.8 for addition information on reporting requirements for benzene streams at ethylene processes at facilities with a TAB <10 Mg/yr and for continuous butadiene wastewater streams.

This report is due annually on the anniversary of NOCS, but could be consolidated with the BWON annual report (or Ethylene MACT periodic report) by agreement with the Administrator. See Section 12.15 of Chapter 12 of this manual.

Other reports required by BWON for streams complying with its provisions are not addressed in this manual.

## Ethylene Compliance Manual

### Appendix A

### Ethylene MACT Definitions

**(Source shown in parenthesis)****Overview**

This Appendix provides a consolidated list of definitions applicable to Ethylene MACT. The source of each definition and any provisos associated with it are indicated in parenthesis at the end of the definition. Where a term is defined in General Provisions, Subpart YY and/or the Ethylene MACT portion of Subpart YY (i.e., §63.1103(e)(2)) it has been assumed that the most specific section controls (e.g. definitions in the Ethylene MACT section of Subpart YY (§63.1103(e)(2))) supersede the definition for the same term in §63.1101 of Subpart YY and/or in §63.2 of the General Provisions). Where multiple definitions may apply to ethylene equipment all are shown.

Definitions not germane to the ethylene source category (e.g., those associated with batch operations, §61.2 definitions associated with applicability) have not been included. For applicability terms (e.g. storage tank) defined both in Subpart YY and subparts SS, UU or WW, the Subpart YY definition is assumed to supersede, but both are shown if significantly different.

For Ethylene MACT waste, wastewater and heat exchange system requirements, §63.1082(a) of Subpart XX specifies that the definitions from §63.1103(e) and §61.341 of BWON apply. There are some differences in definitions between §61.341 and the definitions applicable to other emission types. These differences should be carefully considered when implementing the wastewater provisions. Additionally, definitions from §61.2 will apply to the waste and wastewater requirements in BWON, as well as the definitions from §63.2.

Brackets indicate substitution of language to clarify applicability. e.g., “Part 63” substituted for “this part”.

**Consolidated List of Definitions**

*Act* means the Clean Air Act (42 U.S.C. 7401 *et seq.*, as amended by Pub. L. 101–549, 104 Stat. 2399). (§63.2; §61.2 definition is essentially the same.)

*Actual emissions* is defined in subpart D of [Part 63] for the purpose of granting a compliance extension for an early reduction of hazardous air pollutants. (§63.2)

*Administrator* means the Administrator of the United States Environmental Protection Agency or his or her authorized representative (e.g., a State that has been delegated the authority to implement the provisions of [Part 63]). (§63.2; §61.2 definition is essentially the same.)

*Affected source*, for the purposes of [Part 63], means the collection of equipment, activities, or both within a single contiguous area and under common control that is included in a Section 112(c) source category or subcategory for which a Section 112(d) standard or other relevant standard is established pursuant to Section 112 of the Act. Each relevant standard will define the “affected source,” as defined in this paragraph unless a different definition is warranted based on a published justification as to why this definition would result in significant administrative, practical, or implementation problems and why the different definition would resolve those problems. The term “affected source,” as used in [Part 63], is separate and distinct from any other use of that term in EPA regulations such as those implementing Title IV of the Act. Affected source may be defined differently for Part 63 than affected facility and stationary source in Parts 60 and 61, respectively. This definition of “affected source,” and the procedures for adopting an alternative definition of “affected source,” shall apply to each Section 112(d) standard for which the initial proposed rule is signed by the Administrator after June 30, 2002. (§63.2; The Ethylene MACT affected source is defined in §63.1103(e)(1)(i).)

*Alternative emission limitation* means conditions established pursuant to sections 112(i)(5) or 112(i)(6) of the Act by the Administrator or by a State with an approved permit program. (§63.2)

*Alternative emission standard* means an alternative means of emission limitation that, after notice and opportunity for public comment, has been demonstrated by an owner or operator to the Administrator's satisfaction to achieve a reduction in emissions of any air pollutant at least equivalent to the reduction in emissions of such pollutant achieved under a relevant design, equipment, work practice, or operational emission standard, or combination thereof, established under [Part 63] pursuant to Section 112(h) of the Act. (§63.2)

*Alternative method* means any method of sampling and analyzing for an air pollutant which is not a reference method but which has been demonstrated to the Administrator's satisfaction to produce results adequate for the Administrator's determination of compliance. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*Alternative test method* means any method of sampling and analyzing for an air pollutant that is not a test method in [Title 40, Chapter I] and that has been demonstrated to the Administrator's satisfaction, using Method 301 in Appendix A of [Part 63], to produce results adequate for the Administrator's determination that it may be used in place of a test method specified in [Part 63]. (§63.2)

*Alternative test method* means any method of sampling and analyzing for an air pollutant that is not a reference test or equivalent method, and that has been demonstrated to the Administrator's satisfaction, using Method 301 in appendix A of this Part 63, or previously approved by the Administrator prior to the promulgation date of standards for an affected source or affected facility under a referencing subpart, to produce results adequate for the Administrator's determination that it may be used in place of a test method specified in [Subpart SS]. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Approved permit program* means a State permit program approved by the Administrator as meeting the requirements of part 70 of this [Title 40 Chapter I] or a Federal permit program established in [Title 40 Chapter I] pursuant to Title V of the Act (42 U.S.C. 7661). (§63.2 and §61.2)

*Area source* means any stationary source of hazardous air pollutants that is not a major source as defined in [Part 63]. (§63.2)

*Benzene concentration* means the fraction by weight of benzene in a waste as determined in accordance with the procedures specified in §61.355 of [Part 61 Subpart FF]. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Boiler* means any enclosed combustion device that extracts useful energy in the form of steam and is not an incinerator or a process heater. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Bottoms receiver* means a tank that collects distillation bottoms before the stream is sent for storage or for further downstream processing. (§63.1101)

*By compound* means by individual stream components, not carbon equivalents. (§63.1101 and §63.981)

*Capacity* means the volume of liquid that is capable of being stored in a vessel, determined by multiplying the vessel's internal cross-sectional area by the internal height of the shell. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW; essentially the same definition in §63.1101.)

*Car-seal* means a seal that is placed on a device that is used to change the position of a valve (e.g., from opened to closed) in such a way that the position of the valve cannot be changed without breaking the seal. (§61.341 and §63.1020 – Applies for Ethylene MACT BWON wastes and for equipment leak components complying with Subpart UU.)

*Chemical manufacturing plant* means any facility engaged in the production of chemicals by chemical, thermal, physical, or biological processes for use as a product, co-product, by-product, or intermediate including but not limited to industrial organic chemicals, organic pesticide products, pharmaceutical preparations, paint and allied products, fertilizers, and agricultural chemicals. Examples of chemical manufacturing plants include facilities at which process units are operated to produce one or more of the following chemicals: benzenesulfonic acid, benzene, chlorobenzene, cumene, cyclohexane, ethylene, ethylbenzene, hydroquinone, linear alkylbenzene, nitrobenzene, resorcinol, sulfolane, or styrene. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Closed-loop system* means an enclosed system that returns process fluid to the process and is not vented directly to the atmosphere. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Closed-purge system* means a system or combination of systems and portable containers to capture purged liquids. Containers must be covered or closed when not being filled or emptied. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Closed vent system* means a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission point to a control device. A closed vent system does not include the vapor collection system that is part of any tank truck or railcar or the loading arm or hose that is used for vapor return. For transfer racks, the closed vent system begins at, and includes, the first block valve on the downstream side of the loading arm or hose used to convey displaced vapors. (§63.1101; Definitions in §61.341 and §63.1020 for Ethylene MACT BWON wastes and equipment leak components complying with Subpart UU only contains the first sentence; Definition in §63.981 for Ethylene MACT closed vent systems and control devices complying with Subpart SS ends after “railcar” in the second sentence.)

*Closed vent system shutdown* means a work practice or operational procedure that stops production from a process unit or part of a process unit during which it is technically feasible to clear process material from a closed vent system or part of a closed vent system consistent with safety constraints and during which repairs can be effected. An unscheduled work practice or operational procedure that stops production from a process unit or part of a process unit for less than 24 hours is not a closed vent system shutdown. An unscheduled work practice or operational procedure that would stop production from a process unit or part of a process unit for a shorter period of time than would be required to clear the closed vent system or part of the closed vent system of materials and start up the unit, and would result in greater emissions than delay of repair of leaking components until the next scheduled closed vent system shutdown, is not a closed vent system shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping production are not closed vent system shutdowns. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Combustion device* means an individual unit of equipment, such as a flare, incinerator, process heater, or boiler, used for the combustion of organic emissions. (§63.981 and 1020 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS and equipment leak components complying with Subpart UU.)

*Commenced* means, with respect to construction or reconstruction of an affected source, that an owner or operator has undertaken a continuous program of construction or reconstruction or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or reconstruction. (§63.2)

*Compliance date* means the date by which an affected source is required to be in compliance with a relevant standard, limitation, prohibition, or any federally enforceable requirement established by the Administrator (or a State with an approved permit program) pursuant to Section 112 of the Act. (§63.2)

*Compliance equipment* means monitoring equipment used by an owner or operator of an affected source under [Subpart YY] to demonstrate compliance with an operation or emission limit standard. (§63.1101)

*Compliance schedule* means:

(1) In the case of an affected source that is in compliance with all applicable requirements established under [Part 63], a statement that the source will continue to comply with such requirements; or

(2) In the case of an affected source that is required to comply with applicable requirements by a future date, a statement that the source will meet such requirements on a timely basis and, if required by an applicable requirement, a detailed schedule of the dates by which each step toward compliance will be reached; or

(3) In the case of an affected source not in compliance with all applicable requirements established under [Part 63], a schedule of remedial measures, including an enforceable sequence of actions or operations with milestones and a schedule for the submission of certified progress reports, where applicable, leading to compliance with a relevant standard, limitation, prohibition, or any federally enforceable requirement established pursuant to Section 112 of the Act for which the affected source is not in compliance. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based. (§63.2)

*Connector* means flanged, screwed, or other joined fittings used to connect two pipelines or a pipeline and a piece of equipment. A common connector is a flange. Joined fittings welded completely around the circumference of the interface are not considered connectors for the purpose of this regulation. For the purpose of reporting and recordkeeping, connector means joined fittings that are not inaccessible, ceramic, or ceramic-lined (e.g., porcelain, glass, or glass-lined) as described in §63.1027(e)(2). (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Construction* means the on-site fabrication, erection, or installation of an affected source. Construction does not include the removal of all equipment comprising an affected source from an existing location and reinstallation of such equipment at a new location. The owner or operator of an existing affected source that is relocated may elect not to reinstall minor ancillary equipment including, but not limited to, piping, ductwork, and valves. However, removal and reinstallation of an affected source will be construed as reconstruction if it satisfies the criteria for reconstruction as defined in this section. The costs of replacing minor ancillary equipment must be considered

in determining whether the existing affected source is reconstructed. (§63.2)

*Container* means any portable waste management unit in which a material is stored, transported, treated, or otherwise handled. Examples of containers are drums, barrels, tank trucks, barges, dumpsters, tank cars, dump trucks, and ships. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Continuous butadiene waste stream* means the continuously flowing process wastewater from the following equipment: The aqueous drain from the debutanizer reflux drum, water separators on the C4 crude butadiene transfer piping, and the C4 butadiene storage equipment; and spent wash water from the C4 crude butadiene carbonyl wash system. The continuous butadiene waste stream does not include butadiene streams generated from sampling, maintenance activities, or shutdown purges. The continuous butadiene waste stream does not include butadiene streams from equipment that is currently an affected source subject to the control requirements of another NESHAP. The continuous butadiene waste stream contains less than 10 parts per million by weight (ppmw) of benzene. (§63.1082(b) – Applies for Ethylene MACT waste, waste water and heat exchange system requirements.)

*Continuous emission monitoring system (CEMS)* means the total equipment that may be required to meet the data acquisition and availability requirements of [Part 63], used to sample, condition (if applicable), analyze, and provide a record of emissions. (§63.2)

*Continuous monitoring system (CMS)* is a comprehensive term that may include, but is not limited to, continuous emission monitoring systems, continuous opacity monitoring systems, continuous parameter monitoring systems, or other manual or automatic monitoring that is used for demonstrating compliance with an applicable regulation on a continuous basis as defined by the regulation. (§63.2)

*Continuous opacity monitoring system (COMS)* means a continuous monitoring system that measures the opacity of emissions. (§63.2)

*Continuous parameter monitoring system or CPMS* means the total equipment that may be required to meet the data acquisition and availability requirements of [Subpart YY], and that is used to sample, condition (if applicable), analyze, and provide a record of process or control system parameters. (§63.1101, §63.981 and §63.1020 –Supersedes definition in §62.2.)

*Continuous record* means documentation, either in hard copy or computer readable form, of data values measured at least once every 15 minutes and recorded at the frequency specified in §63.998(b). (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Continuous unit operation* means a unit operation where the inputs and outputs flow continuously. Continuous unit operations typically approach steady-state conditions. Continuous unit operations typically involve the simultaneous addition of raw material and withdrawal of the product. (§63.1101)

*Control device* means, with the exceptions noted below, a combustion device, recovery device, recapture device, or any combination of these devices used to comply with [Subpart YY or Subpart SS]. For process vents from continuous unit operations at [affected sources] where the applicability criteria includes a TRE index value, recovery devices are not considered to be control devices. Primary condensers on steam strippers or fuel gas systems are not considered to be control devices. (§63.981 and §63.1101)

NOTE: The second sentence of the control device definition does not apply for Ethylene MACT, since TRE is not used as the process vent control criteria.



*Control device* means any combustion device, recovery device, recapture device, or any combination of these devices used to comply with [Subpart UU]. Such equipment or devices include, but are not limited to, absorbers, carbon adsorbers, condensers, incinerators, flares, boilers, and process heaters. Primary condensers on steam strippers or fuel gas systems are not considered control devices. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Control device* means an enclosed combustion device, vapor recovery system, or flare. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Control System* means the combination of the closed vent system and the control devices used to collect and control vapors or gases from a regulated emission source. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Cover* means a device or system which is placed on or over a waste placed in a waste management unit so that the entire waste surface area is enclosed and sealed to minimize air emissions. A cover may have openings necessary for operation, inspection, and maintenance of the waste management unit such as access hatches, sampling ports, and gauge wells provided that each opening is closed and sealed when not in use. Examples of covers include a fixed roof installed on a tank, a lid installed on a container, and an air-supported enclosure installed over a waste management unit. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Day* means a calendar day. (§63.981 and 1101)

*Deck cover* means a device which covers an opening in a floating roof deck. Some deck covers move horizontally relative to the deck (i.e., a sliding cover). (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Dilution steam blowdown waste stream* means any continuously flowing process wastewater stream resulting from the quench and compression of cracked gas (the cracking furnace effluent) at an ethylene production unit and is discharged from the unit. This stream typically includes the aqueous or oily-water stream that results from condensation of dilution steam (in the cracking furnace quench system), blowdown from dilution steam generation systems, and aqueous streams separated from the process between the cracking furnace and the cracked gas dehydrators. The dilution steam blowdown waste stream does not include dilution steam blowdown streams generated from sampling, maintenance activities, or shutdown purges. The dilution steam blowdown waste stream also does not include blowdown that has not contacted HAP-containing process materials. (§63.1082(b) – Applies for Ethylene MACT waste, waste water and heat exchange system requirements.)

*Distance piece* means an open or enclosed casing through which the piston rod travels, separating the compressor cylinder from the crankcase. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Distillate receiver* means overhead receivers, overhead accumulators, reflux drums, and condenser(s) including ejector condenser(s) associated with a distillation unit. (§63.1101)

*Distillation unit* means a device or vessel in which one or more feed streams are separated into two or more exit streams, each exit stream having component concentrations different from those in the feed stream(s). The separation is achieved by the redistribution of the components between the liquid and the vapor phases by vaporization and condensation as they approach equilibrium within the distillation unit. Distillation unit includes the distillate receiver, reboiler, and any associated vacuum pump or steam jet. (§63.1101)

*Double block and bleed system* means two block valves connected in series with a bleed valve or line that can vent the line between the two block valves. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Ductwork* means a conveyance system such as those commonly used for heating and ventilation systems. It is often made of sheet metal and often has sections connected by screws or crimping. Hard-piping is not ductwork. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Effective date* means:

(1) With regard to an emission standard established under [Part 63], the date of promulgation in the Federal Register of such standard; or

(2) With regard to an alternative emission limitation or equivalent emission limitation determined by the Administrator (or a State with an approved permit program), the date that the alternative emission limitation or equivalent emission limitation becomes effective according to the provisions of [Part 63]. (§63.2)

*Emission point* means an individual process vent, storage vessel, transfer rack, wastewater stream, kiln, fiber spinning line, equipment leak, or other point where a gaseous stream is released. (§63.1101)

*Emission standard* means a national standard, limitation, prohibition, or other regulation promulgated in a subpart of [Part 63] pursuant to Sections 112(d), 112(h), or 112(f) of the Act. (§63.2)

*Emissions averaging* is a way to comply with the emission limitations specified in a relevant standard, whereby an affected source, if allowed under a subpart of [Part 63], may create emission credits by reducing emissions from specific points to a level below that required by the relevant standard, and those credits are used to offset emissions from points that are not controlled to the level required by the relevant standard. (§63.2)

*Empty* or *emptying* means the partial or complete removal of stored liquid from a storage vessel. Storage vessels that contain liquid only as wall or bottom clingage, or in pools due to bottom irregularities, are considered completely empty. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*EPA* means the United States Environmental Protection Agency. (§63.2)

*Equipment* means each of the following that is subject to control under [Subpart YY]: pump, compressor, agitator, pressure relief device, sampling collection system, open-ended valve or line, valve, connector, instrumentation system in organic hazardous air pollutant service as defined in §63.1103 for the applicable process unit, whose primary product is a product produced by a source category subject to [Subpart YY]. (§63.1101)

*Equipment* means each pump, compressor, agitator, pressure relief device, sampling connection system, open-ended valve or line, valve, connector, and instrumentation system in regulated material service; and any control devices or systems used to comply with this subpart. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

NOTE: Since Subpart UU references Subpart SS for closed vent system and control device requirements, the difference between this definition and the Subpart YY definition appears moot.

*Equivalent emission limitation* means any maximum achievable control technology emission limitation or requirements which are applicable to a major source of hazardous air pollutants and are adopted by the Administrator (or a State with an approved permit program) on a case-by-case basis, pursuant to Section 112(g) or (j) of the Act. (§63.2)

*Equivalent method* means any method of sampling and analysis for an air pollutant that has been demonstrated to the Administrator's satisfaction to have a consistent and quantitatively known relationship to the

reference method, under specified conditions. (§63.1101)

*Ethylene process vent* means a gas stream with a flow rate greater than 0.005 standard cubic meters per minute containing greater than 20 parts per million by volume HAP that is continuously discharged during operation of an ethylene production unit, as defined in [§63.1103(e)(2)]. Ethylene process vents are gas streams that are discharged to the atmosphere (or the point of entry into a control device, if any) either directly or after passing through one or more recovery devices. Ethylene process vents do not include relief valve discharges; gaseous streams routed to a fuel gas system; leaks from equipment regulated under [Subpart YY]; episodic or nonroutine releases such as those associated with startup, shutdown, and malfunction; and in situ sampling systems (online analyzers). (§63.1103(e)(2); supersedes definition of “process vent” in §63.1101).

*Ethylene production or production unit* means a chemical manufacturing process unit in which ethylene and/or propylene are produced by separation from petroleum refining process streams or by subjecting hydrocarbons to high temperatures in the presence of steam. The ethylene production unit includes the separation of ethylene and/or propylene from associated streams such as a C4 product, pyrolysis gasoline, and pyrolysis fuel oil. Ethylene production does not include the manufacture of SOCOMI chemicals such as the production of butadiene from the C4 stream and aromatics from pyrolysis gasoline. (§63.1103(e)(2))

*Excess emissions* means emissions in excess of those that would have occurred if there were no start-up, shutdown, or malfunction and the owner or operator complied with the relevant provisions of [Subpart YY]. (§63.1101)

*Excess emissions and continuous monitoring system performance report* is a report that must be submitted periodically by an affected source in order to provide data on its compliance with relevant emission limits, operating parameters, and the performance of

its continuous parameter monitoring systems. (§63.2)

*Existing source* means any affected source that is not a new source. (§63.2)

*External floating roof* or *EFR* means a floating roof located in a storage vessel without a fixed roof. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*External floating roof* means a pontoon-type or double-deck type cover with certain rim sealing mechanisms that rests on the liquid surface in a waste management unit with no fixed roof. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Facility* means all process units and product tanks that generate waste within a stationary source, and all waste management units that are used for waste treatment, storage, or disposal within a stationary source. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Federally enforceable* means all limitations and conditions that are enforceable by the Administrator and citizens under the Act or that are enforceable under other statutes administered by the Administrator. Examples of federally enforceable limitations and conditions include, but are not limited to:

- (1) Emission standards, alternative emission standards, alternative emission limitations, and equivalent emission limitations established pursuant to Section 112 of the Act as amended in 1990;
- (2) New source performance standards established pursuant to Section 111 of the Act, and emission standards established pursuant to Section 112 of the Act before it was amended in 1990;
- (3) All terms and conditions in a Title V permit, including any provisions that limit a source's potential to emit, unless expressly designated as not federally enforceable;
- (4) Limitations and conditions that are part of an approved State Implementation Plan (SIP) or a Federal Implementation Plan (FIP);
- (5) Limitations and conditions that are part of a Federal construction permit issued under 40

CFR 52.21 or any construction permit issued under regulations approved by the EPA in accordance with 40 CFR part 51;

(6) Limitations and conditions that are part of an operating permit where the permit and the permitting program pursuant to which it was issued meet all of the following criteria:

(i) The operating permit program has been submitted to and approved by EPA into a State implementation plan (SIP) under Section 110 of the CAA;

(ii) The SIP imposes a legal obligation that operating permit holders adhere to the terms and limitations of such permits and provides that permits which do not conform to the operating permit program requirements and the requirements of EPA's underlying regulations may be deemed not "federally enforceable" by EPA;

(iii) The operating permit program requires that all emission limitations, controls, and other requirements imposed by such permits will be at least as stringent as any other applicable limitations and requirements contained in the SIP or enforceable under the SIP, and that the program may not issue permits that waive, or make less stringent, any limitations or requirements contained in or issued pursuant to the SIP, or that are otherwise "federally enforceable";

(iv) The limitations, controls, and requirements in the permit in question are permanent, quantifiable, and otherwise enforceable as a practical matter; and

(v) The permit in question was issued only after adequate and timely notice and opportunity for comment for EPA and the public.

(7) Limitations and conditions in a State rule or program that has been approved by the EPA under subpart E of [Part 63] for the purposes of implementing and enforcing Section 112; and

(8) Individual consent agreements that the EPA has legal authority to create. (§63.2)

*Fill or filling* means the introduction of liquid into a storage vessel, but not necessarily to capacity. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*First attempt at repair*, for the purposes of [Subpart SS and UU], means to take action for the purpose of stopping or reducing leakage of organic material to the atmosphere, followed by monitoring as specified in [§§63.983(c) or §63.1023(b) and (c)] to verify whether the leak is repaired, unless the owner or operator determines by other means that the leak is not repaired. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Fixed capital cost* means the capital needed to provide all the depreciable components of an existing source. (§63.2)

*Fixed roof* means a roof that is mounted (i.e., permanently affixed) on a storage vessel and that does not move with fluctuations in stored liquid level. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Fixed roof* means a cover that is mounted on a waste management unit in a stationary manner and that does not move with fluctuations in liquid level. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Flame zone* means the portion of the combustion chamber in a boiler or process heater occupied by the flame envelope. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Flexible fabric sleeve seal* means a seal made of an elastomeric fabric (or other material) which covers an opening in a floating roof deck, and which allows the penetration of a fixed roof support column. The seal is attached to the rim of the deck opening and extends to the outer surface of the column. The seal is draped (but does not contact the stored liquid) to allow the horizontal movement of the deck relative to the column. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Floating roof* means a roof that floats on the surface of the liquid in a storage vessel. A floating roof substantially covers the stored liquid surface (but is not necessarily in contact with the entire surface), and is comprised of a deck, a rim seal, and miscellaneous deck fittings. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Floating roof* means a cover with certain rim sealing mechanisms consisting of a double deck, pontoon single deck, internal floating cover or covered floating roof, which rests upon and is supported by the liquid being contained, and is equipped with a closure seal or seals to close the space between the roof edge and unit wall. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Flow indicator* means a device which indicates whether gas flow is present in a line or vent system. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Flow indicator* means a device which indicates whether gas flow is, or whether the valve position would allow gas flow to be, present in a line. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Fugitive emissions* means those emissions from a stationary source that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Under Section 112 of the Act, all fugitive emissions are to be considered in determining whether a stationary source is a major source. (§63.2)

*Fuel gas* means gases that are combusted to derive useful work or heat. (§63.981, §63.1101 and §63.1020 - Does not apply to waste or wastewater requirements for ethylene production sources.)

*Fuel gas system* means the offsite and onsite piping and flow and pressure control system that gathers gaseous stream(s) generated by onsite operations, may blend them with other sources of gas, and transports the gaseous stream for use as a fuel gas in combustion devices or in-process combustion equipment, such as furnaces and gas turbines, either singly

or in combination. (§63.981 and §63.1101 - Does not apply to waste or wastewater requirements for ethylene production sources; essentially the same definition is in §63.1020 for Ethylene MACT equipment leak components complying with Subpart UU.)

*Fuel gas system* means the offsite and onsite piping and control system that gathers gaseous streams generated by facility operations, may blend them with sources of gas, if available, and transports the blended gaseous fuel at suitable pressures for use as fuel in heaters, furnaces, boilers, incinerators, gas turbines, and other combustion devices located within or outside the facility. The fuel is piped directly to each individual combustion device, and the system typically operates at pressures over atmospheric. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Hard-piping* means pipe or tubing that is manufactured and properly installed using good engineering judgment and standards, such as ANSI B31.3. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Hazardous air pollutant* means any air pollutant listed in or pursuant to Section 112(b) of the Act. (§63.2)

*Heat exchange system* means any cooling tower system or once-through cooling water system (e.g., river or pond water). A heat exchange system can include more than one heat exchanger and can include an entire recirculating or once-through cooling system. (§63.1082(b) – Applies for Ethylene MACT waste, waste water and heat exchange system requirements. Supersedes a similar definition in §63.1103(e)(2)).

*High throughput transfer rack* means those transfer racks that transfer a total of 11.8 million liters per year or greater of liquid containing regulated material. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Impurity* means a substance that is produced coincidentally with the primary product, or is present in a raw material. An impurity does not serve a useful purpose in the production or use of the primary product and is not isolated. (§63.1101)

*Incinerator* means an enclosed combustion device that is used for destroying organic compounds. Auxiliary fuel may be used to heat waste gas to combustion temperatures. Any energy recovery section present is not physically formed into one manufactured or assembled unit with the combustion section; rather, the energy recovery section is a separate section following the combustion section and the two are joined by ducts or connections carrying flue gas. The above energy recovery section limitation does not apply to an energy recovery section used solely to preheat the incoming vent stream or combustion air. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Individual drain system* means the system used to convey waste from a process unit, product storage tank, or waste management unit to a waste management unit. The term includes all process drains and common junction boxes, together with their associated sewer lines and other junction boxes, down to the receiving waste management unit. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*In food and medical service* means that a piece of equipment in regulated material service contacts a process stream used to manufacture a Food and Drug Administration regulated product where leakage of a barrier fluid into the process stream would cause any of the following:

- (1) A dilution of product quality so that the product would not meet written specifications,
- (2) An exothermic reaction which is a safety hazard,
- (3) The intended reaction to be slowed down or stopped, or

- (4) An undesired side reaction to occur. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*In gas and vapor service* means that a piece of equipment in regulated material service contains a gas or vapor at operating conditions. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*In heavy liquid service* means that a piece of equipment in regulated material service is not in gas and vapor service or in light liquid service. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Initial fill* or *initial filling* means the first introduction of liquid into a storage vessel that is either newly constructed or has not been in liquid service for a year or longer. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Initial startup* means, for new sources, the first time the source begins production. For additions or changes not defined as a new source by [Subpart YY], initial startup means the first time additional or changed equipment is put into operation. Initial startup does not include operation solely for testing equipment. Initial startup does not include subsequent startup (as defined in [§63.1101]) of process units following malfunctions or process unit shutdowns. Except for equipment leaks, initial startup also does not include subsequent startups (as defined in [§63.1101]) of process units following changes in product for flexible operation units or following recharging of equipment in batch unit operations. (§63.1101 Essentially the same definition in §63.1020, which applies for Ethylene MACT equipment leak components complying with Subpart UU)

*In light liquid service* means that a piece of equipment in regulated material service contains a liquid that meets the following conditions:

- (1) The vapor pressure of one or more of the organic compounds is greater than 0.3 kilopascals at 20°C,

(2) The total concentration of the pure organic compounds constituents having a vapor pressure greater than 0.3 kilopascals at 20°C is equal to or greater than 20 percent by weight of the total process stream, and

(3) The fluid is a liquid at operating conditions.

(Note to definition of "in light liquid service": Vapor pressures may be determined by standard reference texts or ASTM D-2879.) (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*In liquid service* means that a piece of equipment in regulated material service is not in gas and vapor service. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*In organic hazardous air pollutant or in organic HAP service* means that piece of equipment either contains or contracts a fluid (liquid or gas) that is at least 5 percent by weight of total organic HAP's as determined according to the provisions of §63.180(d) of Subpart H. The provisions of §63.180(d) of Subpart H also specify how to determine that a piece of equipment is not in organic HAP service. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

NOTE: See definition of organic hazardous air pollutant. Ethylene MACT defines this term to be a subset of the organics on the HAP list.

*In regulated material service* means, for the purposes of [Subpart UU], equipment which meets the definition of "in VOC service," "in VHAP service," "in organic hazardous air pollutant service," or "in" other chemicals or groups of chemicals "service" as defined in the referencing subpart. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

NOTE: For Ethylene MACT equipment leaks requirements, this is equipment in Appendix D organic HAP service.

*In-situ sampling systems* means nonextractive samplers or in-line samplers. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Instrumentation system* means a group of equipment components used to condition and convey a sample of the process fluid to analyzers and instruments for the purpose of determining process operating conditions (e.g., composition, pressure, flow, etc.). Valves and connectors are the predominant type of equipment used in instrumentation systems; however, other types of equipment may also be included in these systems. Only valves nominally 1.27 centimeters (0.5 inches) and smaller, and connectors nominally 1.91 centimeters (0.75 inches) and smaller in diameter are considered instrumentation systems for the purposes of this subpart. Valves greater than nominally 1.27 centimeters (0.5 inches) and connectors greater than nominally 1.91 centimeters (0.75 inches) associated with instrumentation systems are not considered part of instrumentation systems and must be monitored individually. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Internal floating roof* or *IFR* means a floating roof located in a storage vessel with a fixed roof. For the purposes of [Subpart WW], an external floating roof located in a storage vessel to which a fixed roof has been added is considered to be an internal floating roof. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Internal floating roof* means a cover that rests or floats on the liquid surface inside a waste management unit that has a fixed roof. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*In vacuum service* means that equipment is operating at an internal pressure which is at least 5 kilopascals below ambient pressure. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Issuance* of a part 70 permit will occur, if the State is the permitting authority, in accordance with the requirements of part 70 of this chapter and the applicable, approved State permit program. When the EPA is the permitting authority, issuance of a Title V permit occurs immediately after the EPA takes final action on the final permit. (§63.2 and §61.2))

*Liquid-mounted seal* means a resilient or liquid-filled rim seal designed to contact the stored liquid. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Liquid-mounted seal* means a foam or liquid-filled primary seal mounted in contact with the liquid between the waste management unit wall and the floating roof continuously around the circumference. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Liquids dripping* means any visible leakage from the seal including dripping, spraying, misting, clouding, and ice formation. Indications of liquids dripping include puddling or new stains that are indicative of an existing evaporated drip. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Loading* means the introduction of waste into a waste management unit but not necessarily to complete capacity (also referred to as filling). (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Low throughput transfer rack* means a transfer rack that transfers less than a total of 11.8 million liters per year of liquid containing regulated HAP. (§63.981 and §63.1101)

*Major source* means 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 considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants, unless the Administrator establishes a lesser quantity, or in the case of radionuclides,

different criteria from those specified in this sentence. (§63.2)

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded.. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. (§63.1101 - overrides definition in §63.2)

*Maximum organic vapor pressure* means the equilibrium partial pressure exerted by the waste at the temperature equal to the highest calendar-month average of the waste storage temperature for waste stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for waste stored at the ambient temperature, as determined:

- (1) In accordance with §60.17(c); or
- (2) As obtained from standard reference texts; or
- (3) In accordance with §60.17(a)(37); or
- (4) Any other method approved by the Administrator. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Maximum true vapor pressure* means the equilibrium partial pressure exerted by the total organic HAP in the stored or transferred liquid at the temperature equal to the highest calendar-month average of the liquid storage or transfer temperature for liquids stored or transferred above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for liquids stored or transferred at the ambient temperature, as determined:

- (1) In accordance with methods described in American Petroleum Institute Publication 2517, Evaporation Loss From External Floating-Roof Tanks (incorporated by



reference as specified in §63.14 of Subpart A of [Part 63]); or

(2) As obtained from standard reference texts; or

(3) As determined by the American Society for Testing and Materials Method D2879-83 (incorporated by reference as specified in §63.14 of Subpart A of [Part 63]); or

(4) Any other method approved by the Administrator. (§63.1101)

*Mechanical shoe seal* or *metallic shoe seal* means a rim seal consisting of a band of metal (or other suitable material) as the sliding contact with the wall of the storage vessel, and a fabric seal to close the annular space between the band and the rim of the floating roof deck. The band is typically formed as a series of sheets (shoes) that are overlapped or joined together to form a ring. The lower end of the band extends into the stored liquid. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Monitoring* means the collection and use of measurement data or other information to control the operation of a process or pollution control device or to verify a work practice standard relative to assuring compliance with applicable requirements. Monitoring is composed of four elements:

(1) Indicator(s) of performance—the parameter or parameters you measure or observe for demonstrating proper operation of the pollution control measures or compliance with the applicable emissions limitation or standard. Indicators of performance may include direct or predicted emissions measurements (including opacity), operational parametric values that correspond to process or control device (and capture system) efficiencies or emissions rates, and recorded findings of inspection of work practice activities, materials tracking, or design characteristics. Indicators may be expressed as a single maximum or minimum value, a function of process variables (for example, within a range of pressure drops), a particular operational or work practice status (for example, a damper position, completion of a

waste recovery task, materials tracking), or an interdependency between two or among more than two variables.

(2) Measurement techniques—the means by which you gather and record information of or about the indicators of performance. The components of the measurement technique include the detector type, location and installation specifications, inspection procedures, and quality assurance and quality control measures. Examples of measurement techniques include continuous emission monitoring systems, continuous opacity monitoring systems, continuous parametric monitoring systems, and manual inspections that include making records of process conditions or work practices.

(3) Monitoring frequency—the number of times you obtain and record monitoring data over a specified time interval. Examples of monitoring frequencies include at least four points equally spaced for each hour for continuous emissions or parametric monitoring systems, at least every 10 seconds for continuous opacity monitoring systems, and at least once per operating day (or week, month, etc.) for work practice or design inspections.

(4) Averaging time—the period over which you average and use data to verify proper operation of the pollution control approach or compliance with the emissions limitation or standard. Examples of averaging time include a 3-hour average in units of the emissions limitation, a 30-day rolling average emissions value, a daily average of a control device operational parametric range, and an instantaneous alarm. (§63.2)

*Monitoring system* means any system, required under the monitoring sections in applicable subparts, used to sample and condition (if applicable), to analyze, and to provide a record of emissions or process parameters. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*New affected source* means the collection of equipment, activities, or both within a single contiguous area and under common control that is included in a Section 112(c) source category or subcategory that is subject to a Section 112(d) or other relevant standard for new sources. This definition of “new affected source,” and the criteria to be utilized in implementing it, shall apply to each Section 112(d) standard for which the initial proposed rule is signed by the Administrator after June 30, 2002. Each relevant standard will define the term “new affected source,” which will be the same as the “affected source” unless a different collection is warranted based on consideration of factors including:

- (1) Emission reduction impacts of controlling individual sources versus groups of sources;
- (2) Cost effectiveness of controlling individual equipment;
- (3) Flexibility to accommodate common control strategies;
- (4) Cost/benefits of emissions averaging;
- (5) Incentives for pollution prevention;
- (6) Feasibility and cost of controlling processes that share common equipment (e.g., product recovery devices);
- (7) Feasibility and cost of monitoring; and
- (8) Other relevant factors. (§63.2)

*New source* means any affected source the construction or reconstruction of which is commenced after the Administrator first proposes a relevant emission standard under [Part 63] establishing an emission standard applicable to such source. [Since the Ethylene MACT was first proposed on December 12, 2000, a new ethylene production unit is one for which construction or reconstruction commenced after December 12, 2000.] (§63.2)

*No detectable emissions* means less than 500 parts per million by volume (ppmv) above background levels, as measured by a detection instrument reading in accordance with the procedures specified in §61.355(h) of [Part 61 Subpart FF]. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Nonrepairable* means that it is technically infeasible to repair a piece of equipment from which a leak has been detected without a process unit or affected facility shutdown. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Oil-water separator* means a waste management unit, generally a tank or surface impoundment, used to separate oil from water. An oil-water separator consists of not only the separation unit but also the forebay and other separator basins, skimmers, weirs, grit chambers, sludge hoppers, and bar screens that are located directly after the individual drain system and prior to additional treatment units such as an air flotation unit, clarifier, or biological treatment unit. Examples of an oil-water separator include an API separator, parallel-plate interceptor, and corrugated-plate interceptor with the associated ancillary equipment. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*One-hour period*, unless otherwise defined in an applicable subpart, means any 60-minute period commencing on the hour. (§63.2)

*On-site* means, with respect to records required to be maintained by [Subpart YY], a location within a plant site that encompasses the affected source. On-site includes, but is not limited to, the affected source to which the records pertain, or central files elsewhere at the plant site. (§63.1101)

*Opacity* means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background. For continuous opacity monitoring systems, opacity means the fraction of incident light that is attenuated by an optical medium. (§63.2)

*Open-ended valve or line* means any valve, except relief valves, having one side of the valve seat in contact with process fluid and one side open to atmosphere, either directly or through open piping. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Operating parameter value* means a minimum or maximum value established for a control device parameter which, if achieved by itself or in combination with one or more other operating parameter values, determines that an owner or operator has complied with an applicable emission limit or operating limit. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Organic hazardous air pollutant or organic HAP* means the compounds listed in Table 1 to Subpart XX of CFR Part 63. (§63.1103(e)(2))

NOTE: The Table 1 compounds are benzene, 1,3-butadiene, cumene, ethylbenzene, hexane, naphthalene, styrene, toluene, o-xylene, m-xylene, and p-xylene.

*Organic monitoring device* means a unit of equipment used to indicate the concentration level of organic compounds based on a detection principle such as infra-red, photoionization, or thermal conductivity. (§63.981 and §63.1020 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS and equipment leak components complying with Subpart UU.)

*Owner or operator* means any person who owns, leases, operates, controls, or supervises a regulated source or a stationary source of which a regulated source is a part. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS. Essentially the same definition in §63.2 and §61.2.)

*Part 70 permit* means any permit issued, renewed, or revised pursuant to part 70 of this chapter. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*Performance audit* means a procedure to analyze blind samples, the content of which is known by the Administrator, simultaneously with the analysis of performance test samples in order to provide a measure of test data quality. (§63.2)

*Performance evaluation* means the conduct of relative accuracy testing, calibration error testing, and other measurements used in validating the continuous monitoring system data. (§63.2)

*Performance level* means the level at which the regulated material in the gases or vapors vented to a control or recovery device is removed, recovered, or destroyed. Examples of control device performance levels include: achieving a minimum organic reduction efficiency expressed as a percentage of regulated material removed or destroyed in the control device inlet stream on a weight-basis; achieving an organic concentration in the control device exhaust stream that is less than a maximum allowable limit expressed in parts per million by volume on a dry basis corrected to 3 percent oxygen if a combustion device is the control device and supplemental combustion air is used to combust the emissions; or maintaining appropriate control device operating parameters indicative of the device performance at specified values. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Performance test* means the collection of data resulting from the execution of a test method (usually three emission test runs) used to demonstrate compliance with a relevant emission limit as specified in the performance test section of [Subpart SS] or in the referencing subpart. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS. Essentially the same definition in §63.2.)

*Permit modification* means a change to a Title V permit as defined in regulations codified in [Title 40 Chapter I] to implement Title V of the Act (42 U.S.C. 7661). (§63.2)

*Permit program* means a comprehensive State operating permit system established pursuant to Title V of the Act (42 U.S.C. 7661) and regulations codified in Part 70 of [Title 40 Chapter I] and applicable State regulations, or a comprehensive Federal operating permit system established pursuant to Title V of the

Act and regulations codified in [Title 40 Chapter I]. (§63.2 and §61.2)

*Permit revision* means any permit modification or administrative permit amendment to a Title V permit as defined in regulations codified in [Title 40 Chapter I] to implement Title V of the Act (42 U.S.C. 7661). (§63.2)

*Permitting authority* means one of the following:

- (1) The State air pollution control agency, local agency, other State agency, or other agency authorized by the Administrator to carry out a permit program under Part 70 of [Title 40 Chapter I]; or
- (2) The Administrator, in the case of EPA-implemented permit programs under Title V of the Act (42 U.S.C. 7661) and Part 71 of [Title 40 Chapter I]. (§63.1101 and §61.2; supersedes definition in §63.2.)

*Plant site* means all contiguous or adjoining property that is under common control, including properties that are separated only by a road or other public right-of-way. Common control includes properties that are owned, leased, or operated by the same entity, parent entity, subsidiary, or any combination thereof. (§63.1101)

*Point of waste generation* means the location where the waste stream exits the process unit component or storage tank prior to handling or treatment in an operation that is not an integral part of the production process, or in the case of waste management units that generate new wastes after treatment, the location where the waste stream exits the waste management unit component. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Pole float* means a float located inside a guidepole that floats on the surface of the stored liquid. The rim of the float has a wiper or seal that extends to the inner surface of the pole. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Pole sleeve* means a device which extends from either the cover or the rim of an opening in a floating roof deck to the outer surface of a pole that passes through the opening. The sleeve extends into the stored liquid. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Pole wiper* means a seal that extends from either the cover or the rim of an opening in a floating roof deck to the outer surface of a pole that passes through the opening. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Pollution Prevention* means *source reduction* as defined under the Pollution Prevention Act (42 U.S.C. 13101–13109). The definition is as follows:

- (1) *Source reduction* is any practice that:
  - (i) Reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and
  - (ii) Reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.
- (2) The term *source reduction* includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.
- (3) The term *source reduction* does not include any practice that alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service. (§63.2)

*Polymerizing monomer* means a compound which may form polymer buildup in pump mechanical seals resulting in rapid mechanical seal failure. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Potential to emit* means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the stationary source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable. (§63.2)

*Pressure release* means the emission of materials resulting from the system pressure being greater than the set pressure of the relief device. This release can be one release or a series of releases over a short time period due to a malfunction in the process. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Pressure relief device or valve* means a safety device used to prevent operating pressures from exceeding the maximum allowable working pressure of the process equipment. A common pressure relief device is a spring-loaded pressure relief valve. Devices that are actuated either by a pressure of less than or equal to 2.5 pounds per square inch gauge or by a vacuum are not pressure relief devices. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Primary fuel* means the fuel that provides the principal heat input to a device. To be considered primary, the fuel must be able to sustain operation without the addition of other fuels. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Process condenser* means a condenser whose primary purpose is to recover material as an integral part of a process. The condenser must support a vapor-to-liquid phase change for periods of source equipment operation that are above the boiling or bubble point of substance(s). Examples of process condensers include distillation condensers, reflux condensers, process condensers in line prior to the vacuum source, and process condensers

used in stripping or flashing operations. (§63.1101)

*Process heater* means an enclosed combustion device that transfers heat liberated by burning fuel directly to process streams or to heat transfer liquids other than water. A process heater may, as a secondary function, heat water in unfired heat recovery sections. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Process unit* means the equipment assembled and connected by pipes or ducts to process raw and/or intermediate materials and to manufacture an intended product. A process unit includes more than one unit operation. (§63.1101 §63.1020 of Subpart UU specifies this definition applies for Ethylene MACT equipment leak components.)

*Process unit* means equipment assembled and connected by pipes or ducts to produce intermediate or final products. A process unit can be operated independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Process unit shutdown* means a work practice or operational procedure that stops production from a process unit, or part of a process unit during which it is technically feasible to clear process material from a process unit, or part of a process unit, consistent with safety constraints and during which repairs can be affected. The following are not considered process unit shutdowns:

- (1) An unscheduled work practice or operations procedure that stops production from a process unit, or part of a process unit, for less than 24 hours.

- (2) An unscheduled work practice or operations procedure that would stop production from a process unit, or part of a process unit, for a shorter period of time than would be required to clear the process unit, or part of the process unit, of materials and start up the unit, and would result in greater emissions than delay of repair of leaking

components until the next scheduled process unit shutdown.

(3) The use of spare equipment and technically feasible bypassing of equipment without stopping production. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU. Essentially the same definition in §63.1101 of Subpart YY.)

*Process unit turnaround* means the shutting down of the operations of a process unit, the purging of the contents of the process unit, the maintenance or repair work, followed by restarting of the process. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Process unit turnaround waste* means a waste that is generated as a result of a process unit turnaround. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Process wastewater* means water which comes in contact with benzene or butadiene during manufacturing or processing operations conducted within an ethylene production unit. Process wastewater is not organic wastes, process fluids, product tank drawdown, cooling water blowdown, steam trap condensate, or landfill leachate. Process wastewater includes direct-contact cooling water. (§63.1082(b) – Supersedes definition in §63.1100. Applies for Ethylene MACT waste, waste water and heat exchange system requirements.)

*Process wastewater stream* means a stream that contains process wastewater. (§63.1101 – Doesn't apply for Ethylene MACT BWON wastes.)

*Process wastewater stream* means a waste stream that contains only process wastewater. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Product* means a compound or chemical which is manufactured as the intended product of the applicable production process unit as defined in §63.1103. By-products, isolated intermediates, impurities, wastes, and trace contaminants are not considered products. (§63.1101)

*Product tank* means a stationary unit that is designed to contain an accumulation of materials that are fed to or produced by a process unit, and is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Product tank drawdown* means any material or mixture of materials discharged from a product tank for the purpose of removing water or other contaminants from the product tank. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Reconstruction*, unless otherwise defined in a relevant standard, means the replacement of components of an affected or a previously nonaffected source to such an extent that:

(1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source; and

(2) It is technologically and economically feasible for the reconstructed source to meet the relevant standard(s) established by the Administrator (or a State) pursuant to Section 112 of the Act. Upon reconstruction, an affected source, or a stationary source that becomes an affected source, is subject to relevant standards for new sources, including compliance dates, irrespective of any change in emissions of hazardous air pollutants from that source. (§63.2)

*Recovery device* means an individual unit of equipment capable of and normally used for the purpose of recovering chemicals for fuel value (i.e., net positive heating value), use, reuse, or for sale for fuel value. Examples of equipment that may be recovery devices include absorbers, carbon adsorbers, condensers, oil-water separators or organic-water separators, or organic removal devices such as decanters, strippers, or thin-film evaporation units. For purposes of the monitoring, recordkeeping, and reporting requirements of this subpart, recapture devices are considered recovery devices. (§63.1101)

*Recovery device* means an individual unit of equipment capable of and normally used for the purpose of recovering chemicals for fuel value (i.e., net positive heating value), use, reuse, or for sale for fuel value, use, or reuse. Examples of equipment that may be recovery devices include absorbers, carbon adsorbers, condensers, oil-water separators or organic-water separators, or organic removal devices such as decanters, strippers, or thin-film evaporation units. For purposes of the monitoring, recordkeeping, and reporting requirements of this subpart, recapture devices are considered recovery devices. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Recovery operations equipment* means the equipment used to separate the components of process streams. Recovery operations equipment includes distillation units, condensers, etc. Equipment used for wastewater treatment shall not be considered recovery operations equipment. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Reference method* means any method of sampling and analyzing for an air pollutant, as described in Appendix B to [Part 61]. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*Referencing subpart* means [Subpart YY]. (§63.981, §63.1020 and 1061 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS, equipment leak components complying with Subpart UU and tanks complying with Subpart WW).

*Rim seal* means a device attached to the rim of a floating roof deck that spans the annular space between the deck and the wall of the storage vessel. When a floating roof has only one such device, it is a primary seal; when there are two seals (one mounted above the other), the lower seal is the primary seal and the upper seal is the secondary seal. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Regulated material*, for purposes of this [Subpart SS or UU], refers to gas from volatile organic liquids (VOL), volatile organic compounds (VOC), hazardous air pollutants (HAP), or other chemicals or groups of chemicals that are regulated by [Subpart YY]. (§63.981 and §63.1020 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS and equipment leak components complying with Subpart UU.)

NOTE: The regulated material for Ethylene MACT is material that contain the Appendix D organic HAPs. See the definition of organic hazardous air pollutant.

*Regulated source* for the purposes of [Subpart SS or UU], means the stationary source, the group of stationary sources, or the portion of a stationary source that is regulated by [Subpart YY]. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU. Essentially the same language in §63.981 for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Relevant standard* means:

- (1) An emission standard;
- (2) An alternative emission standard;
- (3) An alternative emission limitation; or
- (4) An equivalent emission limitation established pursuant to Section 112 of the Act that applies to the collection of equipment, activities, or both regulated by such standard or limitation. A relevant standard may include or consist of a design, equipment, work practice, or operational requirement, or other measure, process, method, system, or technique (including prohibition of emissions) that the Administrator (or a State) establishes for new or existing sources to which such standard or limitation applies. Every relevant standard established pursuant to Section 112 of the Act includes Subpart A of [Part 63], as provided by §63.1(a)(4), and all applicable appendices of [Part 63] or of other parts of [Title 40 Chapter I] that are referenced in that standard. (§63.2)

*Relief device or valve* means a valve used only to release an unplanned, nonroutine discharge. A relief valve discharge can result from an operator error, a malfunction such as a power failure or equipment failure, or other unexpected cause that requires immediate venting of gas from process equipment in order to avoid safety hazards or equipment damage. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Repaired*, for the purposes of [Subparts SS and UU], means that equipment is adjusted, or otherwise altered, to eliminate a leak as defined in the applicable sections of this subpart and unless otherwise specified in applicable provisions of this subpart, is monitored as specified in [§§63.983(c) or §63.1023(b) and (c)] to verify that emissions from the equipment are below the applicable leak definition. (§63.1020 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS and equipment leak components complying with Subpart UU.)

*Research and development facility* means laboratory and pilot plant operations whose primary purpose is to conduct research and development into new processes and products, where the operations are under the close supervision of technically trained personnel, and is not engaged in the manufacture of products for commercial sale, except in a de minimis manner. (§63.1101)

*Responsible official* means one of the following:

(1) For a corporation: A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities and either:

(i) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars); or

(ii) The delegation of authority to such representative is approved in advance by the Administrator.

(2) For a partnership or sole proprietorship: a general partner or the proprietor, respectively.

(3) For a municipality, State, Federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of [Part 63], a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of the EPA).

(4) For affected sources (as defined in [Part 63]) applying for or subject to a Title V permit: “responsible official” shall have the same meaning as defined in part 70 or Federal Title V regulations in this chapter (42 U.S.C. 7661), whichever is applicable. (§63.2)

*Routed to a process or route to a process* means the emissions are conveyed to any enclosed portion of a process unit where the emissions are predominantly recycled and/or consumed in the same manner as a material that fulfills the same function in the process and/or transformed by chemical reaction into materials that are not regulated materials and/or incorporated into a product; and/or recovered. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Routed to a process or route to a process* means the gas streams are conveyed to any enclosed portion of a process unit where the emissions are recycled and/or consumed in the same manner as a material that fulfills the same function in the process; and/or transformed by chemical reaction into materials that are not regulated materials; and/or incorporated into a product; and/or recovered. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)



*Run* means one of a series of emission or other measurements needed to determine emissions for a representative operating period or cycle as specified in [Subpart SS]. Unless otherwise specified, a run may be either intermittent or continuous within the limits of good engineering practice. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS. The §63.2 definition of run consists of only the first sentence.)

*Run* means the net period of time during which an emission sample is collected. Unless otherwise specified, a run may be either intermittent or continuous within the limits of good engineering practice. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*Safety device* means a closure device such as a pressure relief valve, frangible disc, fusible plug, or any other type of device which functions exclusively to prevent physical damage or permanent deformation to a unit or its air emission control equipment by venting gases or vapors directly to the atmosphere during unsafe conditions resulting from an unplanned, accidental, or emergency event. For the purpose of [Part 61 Subpart FF], a safety device is not used for routine venting of gases or vapors from the vapor headspace underneath a cover such as during filling of the unit or to adjust the pressure in this vapor headspace in response to normal daily diurnal ambient temperature fluctuations. A safety device is designed to remain in a closed position during normal operations and open only when the internal pressure, or another relevant parameter, exceeds the device threshold setting applicable to the air emission control equipment as determined by the owner or operator based on manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Sampling connection system* means an assembly of equipment within a process unit or affected facility used during periods of representative operation to take samples of the process fluid. Equipment used to take nonroutine grab samples is not considered a sampling connection system. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Screwed (threaded) connector* means a threaded pipe fitting where the threads are cut on the pipe wall and the fitting requires only two pieces to make the connection (i.e., the pipe and the fitting). (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Secondary fuel* means a fuel fired through a burner other than the primary fuel burner that provides supplementary heat in addition to the heat provided by the primary fuel. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Segregated stormwater sewer system* means a drain and collection system designed and operated for the sole purpose of collecting rainfall runoff at a facility, and which is segregated from all other individual drain systems. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Sensor* means a device that measures a physical quantity or the change in a physical quantity, such as temperature, pressure, flow rate, pH, or liquid level. (§63.981 and §63.1020 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS and equipment leak components complying with Subpart UU.)

*Set pressure* means for the purposes of [Subpart UU], the pressure at which a properly operating pressure relief device begins to open to relieve atypical process system operating pressure. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Sewer line* means a lateral, trunk line, branch line, or other enclosed conduit used to convey waste to a downstream waste management unit. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Shutdown* means the cessation of operation of an affected source or equipment that is used to comply with [Subpart YY], or the emptying and degassing of a storage vessel. For the purposes of [Subpart YY], shutdown includes, but is not limited to, periodic maintenance, replacement of equipment, or repair. Shutdown does not include the routine rinsing or washing of equipment in batch operation between batches. Shutdown includes the decoking of ethylene production unit furnaces. (§63.1101 - supersedes definition in §63.2.)

*Six-minute period* means, with respect to opacity determinations, any one of the 10 equal parts of a 1-hour period. (§63.2)

*Slop oil* means the floating oil and solids that accumulate on the surface of an oil-water separator. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Slotted guidepole* means a guidepole or gaugepole that has slots or holes through the wall of the pole. The slots or holes allow the stored liquid to flow into the pole at liquid levels above the lowest operating level. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Sour water stream* means a stream that:

- (1) Contains ammonia or sulfur compounds (usually hydrogen sulfide) at concentrations of 10 ppm by weight or more;
- (2) Is generated from separation of water from a feed stock, intermediate, or product that contained ammonia or sulfur compounds; and
- (3) Requires treatment to remove the ammonia or sulfur compounds. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Sour water stripper* means a unit that:

- (1) Is designed and operated to remove ammonia or sulfur compounds (usually hydrogen sulfide) from sour water streams;
- (2) Has the sour water streams transferred to the stripper through hard piping or other enclosed system; and
- (3) Is operated in such a manner that the offgases are sent to a sulfur recovery unit, processing unit, incinerator, flare, or other combustion device. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Specific gravity monitoring device* means a unit of equipment used to monitor specific gravity and having a minimum accuracy of  $\pm 0.02$  specific gravity units. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Spent caustic waste stream* means the continuously flowing process wastewater stream that results from the use of a caustic wash system in an ethylene production unit. A caustic wash system is commonly used at ethylene production units to remove acid gases and sulfur compounds from process streams, typically cracked gas. The spent caustic waste stream does not include spent caustic streams generated from sampling, maintenance activities, or shutdown purges. (§63.1082(b) – Applies for Ethylene MACT waste, waste water and heat exchange system requirements.)

*Standard* means a national emission standard including a design, equipment, work practice or operational standard for a hazardous air pollutant proposed or promulgated under [Part 61]. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*Standard conditions* means a temperature of 293 K (68 °F) and a pressure of 101.3 kilopascals (29.92 in. Hg). (§63.2)

*Startup* means the setting into operation of a regulated source and/or equipment required or used to comply with [Subpart YY]. Startup includes initial startup, operation solely for testing equipment, the recharging of equipment in batch operation, and transitional conditions due to changes in product for flexible operation units. (§63.1101 - supersedes definition in §63.2.)

*Start-up* means the setting into operation of a piece of equipment or a control device that is subject to [Subpart UU]. (§63.1020 – Applies for Ethylene MACT equipment leak components complying with Subpart UU.)

*Startup* means the setting in operation of a stationary source for any purpose. (§61.2 - Applies for Ethylene MACT BWON wastes.)

*State* means all non-Federal authorities, including local agencies, interstate associations, and State-wide programs, that have delegated authority to implement:

- (1) The provisions of [Part 63] and/or
- (2) the permit program established under Part 70 of [Title 40 Chapter I].

The term State shall have its conventional meaning where clear from the context. (§63.2)

*Stationary source* means any building, structure, facility, or installation which emits or may emit any air pollutant. (§63.2)

*Storage vessel or tank, for the purposes of regulation under the storage vessel provisions of [Subpart YY],* means a stationary unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) that provides structural support and is designed to hold an accumulation of liquids or other materials. Storage vessel includes surge control vessels and bottoms receiver vessels. For the purposes of regulation under the storage vessel provisions of [Subpart YY], storage vessel does not include vessels permanently attached to motor vehicles such as trucks, railcars, barges, or ships; pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere; or wastewater storage vessels. Wastewater storage vessels are covered under

the wastewater provisions of §63.1106. (§63.1101 §63.1061 of Subpart WW uses only the first sentence of this definition.)

*Supplemental combustion air* means the air that is added to a vent stream after the vent stream leaves the unit operation. Air that is part of the vent stream as a result of the nature of the unit operation is not considered supplemental combustion air. Air required to operate combustion device burner(s) is not considered supplemental combustion air. Air required to ensure the proper operation of catalytic oxidizers, to include the intermittent addition of air upstream of the catalyst bed to maintain a minimum threshold flow rate through the catalyst bed or to avoid excessive temperatures in the catalyst bed, is not considered to be supplemental combustion air. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Surface impoundment* means a waste management unit which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or waste containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Surge control vessel* means a feed drum, recycle drum, or intermediate vessel. Surge control vessels are used within a process unit (as defined in [Subpart YY]) when in-process storage, mixing, or management of flow rates or volumes is needed to assist in production of a product. (§63.1101)

*Tank* means a stationary waste management unit that is designed to contain an accumulation of waste and is constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic) which provide structural support. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Test method* means the validated procedure for sampling, preparing, and analyzing for an air pollutant specified in a relevant standard as the performance test procedure. The test method may include methods described in an appendix of [Title 40 Chapter I], test methods incorporated by reference in [Part 63], or methods validated for an application through procedures in Method 301 of appendix A of [Part 63]. (§63.2)

*Table 9 compounds* means compounds listed in Table 9 of Subpart G of [Part 63]. (§63.1101)

*Temperature monitoring device* means a unit of equipment used to monitor temperature and having a minimum accuracy of  $\pm 1$  percent of the temperature being monitored expressed in degrees Celsius or  $\pm 1.2$  degrees Celsius ( $^{\circ}\text{C}$ ), whichever is greater. (§63.981 – Applies for Ethylene MACT closed vent systems and control devices complying with Subpart SS.)

*Title V permit* means any permit issued, renewed, or revised pursuant to Federal or State regulations established to implement Title V of the Act (42 U.S.C. 7661). A Title V permit issued by a State permitting authority is called a part 70 permit in [Part 61 and 63]. (§63.2)

*Total organic compounds or (TOC)* means the total gaseous organic compounds (minus methane and ethane) in a vent stream, with the concentrations expressed on a carbon basis. (§63.1101)

*Transfer rack* means the collection of loading arms and loading hoses at a single loading rack that is used to fill tank trucks and/or railcars with organic HAP. Transfer rack includes the associated pumps, meters, shutoff valves, relief valves, and other piping and valves. Transfer rack does not include racks, arms, or hoses that contain organic HAP only as impurities; or racks, arms, or hoses that vapor balance during all loading operations. (§63.1103(e)(2); Supersedes definition in §63.1101)

*Treatment process* means a stream stripping unit, thin-film evaporation unit, waste incinerator, or any other process used to comply with §61.348 of [Part 61 Subpart FF]. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Unit operation* means distinct equipment used in processing, among other things, to prepare reactants, facilitate reactions, separate and purify products, and recycle materials. Equipment used for these purposes includes, but is not limited to, reactors, distillation columns, extraction columns, absorbers, decanters, dryers, condensers, and filtration equipment. (§63.1101)

*Vapor balancing system* means a piping system that is designed to collect organic HAP vapors displaced from tank trucks or railcars during loading; and to route the collected organic HAP vapors to the storage vessel from which the liquid being loaded originated, or to compress collected organic HAP vapors and commingle with the raw feed of a production process unit. (§63.1101)

*Visible emission* means the observation of an emission of opacity or optical density above the threshold of vision. (§63.2)

*Vapor-mounted seal* means a foam-filled primary seal mounted continuously around the perimeter of a waste management unit so there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the unit wall, the liquid surface, and the floating roof. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Vapor-mounted seal* means a rim seal designed not to be in contact with the stored liquid. Vapor-mounted seals may include, but are not limited to, resilient seals and flexible wiper seals. (§63.1061 – Applies for Ethylene MACT tanks complying with Subpart WW)

*Waste* means any material resulting from industrial, commercial, mining, or agricultural operations, or from community activities, that is discarded or is being accumulated, stored, or physically, chemically, thermally, or biologically treated prior to being discarded, recycled, or discharged. (§63.1103(e)(2) and §61.341)

*Waste management unit* means a piece of equipment, structure, or transport mechanism used in handling, storage, treatment, or disposal of waste. Examples of a waste management unit include a tank, surface impoundment, container, oil-water separator, individual drain system, steam stripping unit, thin-film evaporation unit, waste incinerator, and landfill. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Waste stream* means the waste generated by a particular process unit, product tank, or waste management unit. The characteristics of the waste stream (e.g., flow rate, HAP concentration, and water content) are determined at the point of waste generation. Examples of a waste stream include process wastewater, product tank drawdown, sludge and slop oil removed from waste management units, and landfill leachate. (§63.1103(e)(2); replaces definition in §63.341, which is the same except for being limited to benzene).

*Wastewater treatment system* means any component, piece of equipment, or installation that receives, manages, or treats process wastewater, product tank drawdown, or landfill leachate prior to direct or indirect discharge in accordance with the National Pollutant Discharge Elimination System permit regulations under 40 CFR part 122. These systems typically include individual drain systems, oil-water separators, air flotation units, equalization tanks, and biological treatment units. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Water seal controls* means a seal pot, p-leg trap, or other type of trap filled with water (e.g., flooded sewers that maintain water levels adequate to prevent air flow through the system) that creates a water barrier between the sewer line and the atmosphere. The water level of the seal must be maintained in the vertical leg of a drain in order to be considered a water seal. (§61.341 – Applies for Ethylene MACT BWON wastes.)

*Working day* means any day on which Federal Government offices (or State government offices for a State that has obtained delegation under Section 112(l)) are open for normal business. Saturdays, Sundays, and official Federal (or where delegated, State) holidays are not working days. (§63.2)

**Ethylene Compliance Manual**  
**Appendix B**  
**§63.1103(e)(3) as of June 2005**  
**(Appendix D parentheticals added)**

Requirements. The owner or operator must control organic HAP (see Appendix D definition) emissions from each affected source emission point by meeting the applicable requirements specified in Table 7 to this section. An owner or operator must perform the applicability assessment procedures and methods for process vents specified in §63.1104, except for paragraphs (d), (g), (h), (i), (j), (l)(1), and (n). An owner or operator must perform the applicability assessment procedures and methods for equipment leaks specified in §63.1107. General compliance, recordkeeping, and reporting requirements are specified in §§63.1108 through §63.1112. Minimization of emissions from startup, shutdown, and malfunctions must be addressed in the startup, shutdown, and malfunction plan required by §63.1111; the plan must also establish reporting and recordkeeping of such events. Procedures for approval of alternate means of emission limitations are specified in §63.1113.

**Table 7 to § 63.1103(e) What Are My Requirements if I Own or Operate an Ethylene Production Existing or New Affected Source?**

If you own or operate . . .	And if . . .	Then you must . . .
(a) A storage vessel (as defined in § 63.1101) that stores liquid containing organic HAP (see Appendix D definition).	(1) The maximum true vapor pressure of total organic HAP (see Appendix D definition) is $\geq 3.4$ kilopascals but $< 76.6$ kilopascals; and the capacity of the vessel is $\geq 4$ cubic meters but $\leq 95$ cubic meters.	(i) Fill the vessel through a submerged pipe; or (ii) Comply with the requirements for storage vessels with capacities $\geq 95$ cubic meters.
(b) A storage vessel (as defined in § 63.1101) that stores liquid containing organic HAP (see Appendix D definition).	(1) The maximum true vapor pressure of total organic HAP (see Appendix D definition) is $\geq 3.4$ kilopascals but $< 76.6$ kilopascals; and the capacity of the vessel is $\geq 95$ cubic meters.	(i) Comply with the requirements of Subpart WW of this part; or (ii) Reduce emissions of total organic HAP (see Appendix D definition) by 98 weight-percent by venting emissions through a closed vent system to any combination of control devices and meet the requirements of §63.982(a)(1).
(c) A storage vessel (as defined in § 63.1101) that stores liquid containing organic HAP (see Appendix D definition).	(1) The maximum true vapor pressure of total organic HAP (see Appendix D definition) is $\geq 76.6$ kilopascals.	(i) Reduce emissions of total organic HAP (see Appendix D definition) by 98 weight-percent by venting emissions through a closed vent system to any combination of control devices and meet the requirements of §63.982(a)(1).

**Table 7 to § 63.1103(e) What Are My Requirements if I Own or Operate an Ethylene Production Existing or New Affected Source? (Cont'd)**

If you own or operate . . .	And if . . .	Then you must . . .
(d) An ethylene process vent (as defined in paragraph (e)(2) of this section).	(1) The process vent is at an existing source and the vent stream has a flow rate $\geq 0.011$ scmm and a total organic HAP (see Appendix D definition) concentration $\geq 50$ parts per million by volume; or the process vent is at a new source and the vent stream has a flow rate $\geq 0.008$ scmm and a total organic HAP (see Appendix D definition) concentration $\geq 30$ parts per million by volume.	(i) Reduce emissions of organic HAP (see Appendix D definition) by 98 weight-percent; or reduce organic HAP (see Appendix D definition) or TOC to a concentration of 20 parts per million by volume; whichever is less stringent, by venting emissions through a closed vent system to any combination of control devices and meet the requirements specified in §63.982(b) and (c)(2).
(e) A transfer rack (as defined in paragraph (e)(2) of this section).	(1) Materials loaded have a true vapor pressure of total organic HAP (see Appendix D definition) $\geq 3.4$ kilopascals and $\geq 76$ cubic meters per day (averaged over any consecutive 30-day period) of HAP containing-material is loaded.	(i) Reduce emissions of organic HAP (see Appendix D definition) by 98 weight-percent; or reduce organic HAP (see Appendix D definition) or TOC to a concentration of 20 parts per million by volume; whichever is less stringent, by venting emissions through a closed vent system to any combination of control devices as specified in §63.1105; or  (ii) Install process piping designed to collect the HAP-containing vapors displaced from tank trucks or railcars during loading and to route it to a process, a fuel gas system, or a vapor balance system, as specified in §63.1105.
(f) Equipment (as defined in §63.1101) that contains or contacts organic HAP (see Appendix D definition).	(1) The equipment contains or contacts $\geq 5$ weight-percent organic HAP (see Appendix D definition); and the equipment is not in vacuum service.	Comply with the requirements of Subpart UU of this part.

**Table 7 to § 63.1103(e) What Are My Requirements if I Own or Operate an Ethylene Production Existing or New Affected Source? (Cont'd)**

If you own or operate . . .	And if . . .	Then you must . . .
(g) Processes that generate waste (as defined in paragraph (e)(2) of this section).	(1) The waste stream contains any of the following HAP: benzene, cumene, ethyl benzene, hexane, naphthalene, styrene, toluene, o- xylene, m- xylene, p- xylene, or 1,3- butadiene.	(i) Comply with the waste requirements of Subpart XX of this part. For ethylene manufacturing process unit waste stream requirements, terms have the meanings specified in Subpart XX.
(h) A heat exchange system (as defined in paragraph (e)(2) of this section).		Comply with the heat exchange system requirements of Subpart XX of this part.



## Appendix C

### Flare Requirements from §63.11(b), as of June 2005 as modified by §63.987 and §63.997

#### Overview and Applicability

Flares must meet the requirements of §63.11(b) of Part 63 Subpart A (General Provisions). Clarifying §63.11(b), §63.987(b) and portions of §63.997 of Subpart SS specify the requirements for flare compliance assessments and §63.987(c) clarifies flare monitoring requirements. Recordkeeping, notification and reporting requirements associated with flares are included in Chapters 11 and 12 of this manual. The clarifying information is shown in boxes in the appropriate place in the §63.11(b) text below.

Flares used to control ethylene process wastewater emissions must comply with §61.349(a)(2)(iii), which references §60.18 rather than §63.11 and the requirements of BWON and Part 61 Subpart A for testing, monitoring, recordkeeping and reporting. While the requirements of §63.11 and §60.18 are virtually identical, the clarifying requirements of §63.987(b) and (c) would not apply to flares used exclusively for ethylene process waste and wastewater emission control.

#### Annotated §63.11(b) Text

(b) *Flares*. (1) Owners or operators using flares to comply with the provisions of this part shall monitor these control devices to assure that they are operated and maintained in conformance with their designs. Applicable subparts will provide provisions stating how owners or operators using flares shall monitor these control devices.

Per §63.987(b)(1), an initial flare compliance assessment is required for any flare used to comply with Subpart SS. Flare compliance assessment records shall be kept as specified in §63.998(a)(1) and a flare compliance assessment report shall be submitted as specified in §63.999(a)(2). See Tables 11-13 and 12-20 of this manual for record and report details. An owner or operator is not required to conduct a performance test to determine percent emission reduction or outlet regulated material or total organic compound concentration when a flare is used.

Per §63.997(b)(1), an owner or operator may request permission to substitute a prior compliance assessment by written application to the Administrator as specified in §63.999(a)(1)(i). The prior test must have been conducted using the same methods specified in §63.987(b)(3) and either no process changes have been made since the test or the owner or operator can demonstrate that the results of the compliance demonstration, with or without adjustments, reliably demonstrate compliance despite process changes.

Additionally, individual compliance assessments may be waived by written application, per §63.999(a)(1)(iii), if, in the Administrator's judgment, the source is meeting the relevant standard(s) on a continuous basis, the source is being operated under an extension or waiver of compliance, or the owner or operator has requested an extension or waiver of compliance and the Administrator is still considering that request.

The initial compliance assessment must be completed by the time specified in §63.997(c), which is 180 days after the compliance date in the Ethylene MACT rule (July 12, 2005). The compliance assessment report must be submitted within 60 days of the completion of the initial compliance assessments.

(2) Flares shall be steam-assisted, air-assisted, or non-assisted.

(3) Flares shall be operated at all times when emissions may be vented to them.

(4) Flares shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. Test Method 22 in appendix A of Part 60 of this chapter shall be used to determine the compliance of flares with the visible emission provisions of this part. The observation period is 2 hours and shall be used according to Method 22.

Per §63.987(b)(3)(i), the visible emissions test is part of a flare compliance assessment. However, the 2 hour observation period is modified for transfer racks. If the loading cycle is less than 2 hours, then the observation period for that run shall be for the entire loading cycle. If additional loading cycles are initiated within the 2-hour period, then visible emissions observations shall be conducted for the additional cycles.

(5) Flares shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.

§63.987(c) expands §63.11(b)(5) as follows: Where a flare is used, the following monitoring equipment is required: a device (including but not limited to a thermocouple, ultra-violet beam sensor, or infrared sensor) capable of continuously detecting that at least one pilot flame or the flare flame is present. Flare flame monitoring and compliance records shall be kept as specified in §63.998(a)(1) and reported as specified in §63.999(a).

Per §63.987(b)(3)(iv), the flame or pilot monitors shall be operated during any flare compliance assessment.

(6) An owner/operator has the choice of adhering to the heat content specifications in paragraph (b)(6)(ii) of this section, and the maximum tip velocity specifications in paragraph (b)(7) or (b)(8) of this section, or adhering to the requirements in paragraph (b)(6)(i) of this section.

(i)(A) Flares shall be used that have a diameter of 3 inches or greater, are nonassisted, have a hydrogen content of 8.0 percent (by volume) or greater, and are designed for and operated with an exit velocity less than 37.2 m/sec (122 ft/sec) and less than the velocity  $V_{max}$ , as determined by the following equation:

$$V_{max} = (X_{H2} - K_1) * K_2$$

Where:

$V_{max}$  = Maximum permitted velocity, m/sec.

$K_1$  = Constant, 6.0 volume-percent hydrogen.

$K_2$  = Constant, 3.9(m/sec)/volume-percent hydrogen.

$X_{H2}$  = The volume-percent of hydrogen, on a wet basis, as calculated by using the American Society for Testing and Materials (ASTM) Method D1946–77. (Incorporated by reference as specified in §63.14).

(B) The actual exit velocity of a flare shall be determined by the method specified in paragraph (b)(7)(i) of this section.

(ii) Flares shall be used only with the net heating value of the gas being combusted at 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted at 7.45 M/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^n C_i H_i$$

Where:

$H_T$  = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K = Constant=

$$1.740 \times 10^{-7} \left( \frac{1}{ppmv} \right) \left( \frac{\text{g-mole}}{\text{scm}} \right) \left( \frac{\text{MJ}}{\text{kcal}} \right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

$C_i$  = Concentration of sample component i in ppmv on a wet basis, as measured for organics by Test Method 18 and measured for hydrogen and carbon monoxide by American Society for Testing and Materials (ASTM) D1946–77 or 90 (Reapproved 1994) (incorporated by reference as specified in §63.14).

$H_i$  = Net heat of combustion of sample component i, kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382–76 or 88 or D4809–95 (incorporated by reference as specified in §63.14) if published values are not available or cannot be calculated.

n = Number of sample components.

Per §63.987(b)(3)(ii), the net heating value of the gas being combusted in a flare shall be calculated as part of the compliance assessment. The above equation is to be used for determining the heating value. However, ASTM D6420–99 (available for purchase from at least one of the following addresses: 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959; or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106) may be used as an alternate to Method 18 for determining component concentrations if:

(1) If the target compound(s) is listed in Section 1.1 of ASTM D6420–99 and the target concentration is between 150 parts per billion by volume and 100 parts per million by volume.

(2) If the target compound(s) is not listed in Section 1.1 of ASTM D6420–99 but is potentially detected by mass spectrometry, an additional system continuing calibration check after each run, as detailed in Section 10.5.3 of ASTM D6420–99, must be followed, met, documented, and submitted with the performance test report even if you do not use a moisture condenser or the compound is not considered soluble.

(3) If a minimum of one sample/analysis cycle is completed at least every 15 minutes.

(7)(i) Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity less than 18.3 m/sec (60 ft/sec), except as provided in paragraphs (b)(7)(ii) and (b)(7)(iii) of this section. The actual exit velocity of a flare shall be determined by dividing by the volumetric flow rate of gas being combusted (in units of emission standard temperature and pressure), as determined by Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR Part 60 of this chapter, as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

Per §63.987(b)(3)(iii), a flare velocity calculation is part of a flare compliance assessment and Test Methods 2F and 2G of Part 60 Appendix A, as appropriate, may also be used to determine volumetric flow rate.

(ii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in paragraph (b)(7)(i) of this section, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec), are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in paragraph (b)(7)(i) of this section, less than the velocity  $V_{\max}$ , as determined by the method specified in this paragraph, but less than 122 m/sec (400 ft/sec) are allowed. The maximum permitted velocity,  $V_{\max}$ , for flares complying with this paragraph shall be determined by the following equation:

$$\text{Log}_{10}(V_{\max}) = (H_T + 28.8) / 31.7$$

Where:

$V_{\max}$  = Maximum permitted velocity, m/sec.

28.8 = Constant.

31.7 = Constant.

$H_T$  = The net heating value as determined in paragraph (b)(6) of this section.

(8) Air-assisted flares shall be designed and operated with an exit velocity less than the velocity  $V_{\max}$ . The maximum permitted velocity,  $V_{\max}$ , for air-assisted flares shall be determined by the following equation:

$$V_{\max} = 8.71 = 0.708(H_T)$$

Where:

$V_{\max}$  = Maximum permitted velocity, m/sec.

8.71 = Constant.

0.708 = Constant.

$H_T$  = The net heating value as determined in paragraph (b)(6)(ii) of this section.

**Appendix D**  
**Organic HAP Definition for Ethylene MACT**  
**(from Table 1 of Part 63 Subpart XX)**

Table 1 to Subpart XX of Part 63—Hazardous Air Pollutants

<u>Hazardous Air Pollutant</u>	<u>CAS No.</u>
Benzene	71432
1,3-Butadiene.	106990
Cumene	98828
Ethyl benzene	100414
Hexane	110543
Naphthalene	91203
Styrene	100425
Toluene	108883
o-Xylene	95476
m-Xylene	108383
p-Xylene	106423