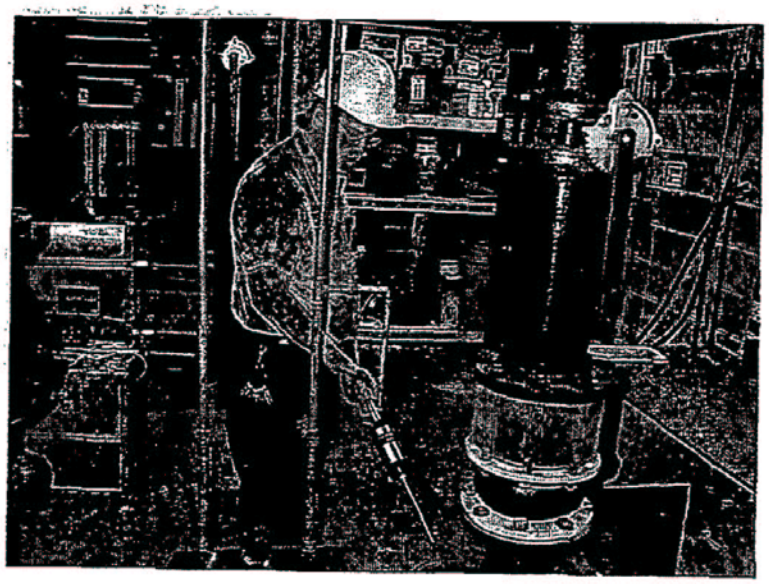
United States Environmental Protection Agency | Enforcement and Compliance Assurance (2224A) | EPA/305/B-98/011 December 1998

EPA

Inspection Manual: Federal Equipment Leak Regulations for the Chemical Manufacturing Industry

Volume II: Chemical Manufacturing Industry Regulations



EPA Office of Compliance
Chemical, Commercial Services, and Municipal Division

Appendices A - B

ABSTRACT

The purpose of this manual is to enhance an inspector's ability to conduct more complete and effective inspections at facilities in the chemical industry that are subject to federal equipment leak regulations. Equipment leak standards are designed to reduce or eliminate emissions of volatile organic compounds (VOCs), volatile hazardous air pollutants (VHAPs), and organic HAPs from the miles of piping and numerous components found in chemical manufacturing processes.

This document is divided into three volumes. The first volume is a manual for inspectors; the second and third volumes describe regulations that apply to the chemical manufacturing and the petroleum refining industries, respectively.

Volume I has five chapters dedicated to helping an inspector:

- Chapter 1 states the goals, background, approaches to rule enforcement, and organization of the document.
- Chapter 2 addresses applicability determinations: ensuring the correct rules are being complied with at a facility, determining whether all appropriate components have been identified, and ensuring the components are properly classified by service.
- Chapter 3 discusses reporting and recordkeeping requirements for NSPS, NESHAP, HON, and RCRA (recordkeeping only), and strategies for reviewing reports and records.
- Chapter 4 covers on-site inspections: walk-throughs and inspections with the inspector monitoring for leaks. It addresses pre-inspection activities, timing and scope, interviews, leak monitoring evaluations, inspections of the process area and records, and post-inspection reviews and reports.
- Chapter 5 discusses recommended inspection techniques and procedures.

Volume II tackles the equipment leak regulations applicable to the chemical manufacturing industry.

- The first three appendices of Volume II summarize the regulations of 40 CFR Part 60 Subpart VV, Part 61 Subparts J and V, Part 63 Subparts H and I, Part 264 Subpart BB, and Part 265 Subpart BB; detail the differences among the regulations; and give the requirements grouped by component.
- Appendix D describes the regulated equipment.
- Appendix E contains the "Method 21" approach to leak detection.
- Appendix F lists chemical manufacturing processes that are subject to HON.
- Appendix G lists organic HAPs that are subject to HON.
- Appendix H lists manufacturing processes and associated organic HAP emissions that are subject to HON.

Volume III contains the equipment leak regulations applicable to the petroleum refining industry.

- The three appendices of Volume III summarize the regulations of 40 CFR Part 60 *Subparts* DDD, GGG, KKK, and QQQ, and Part 63 Subpart CC; detail the differences among the regulations; and give the requirements grouped by component.

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VOLUME II: CHEMICAL MANUFACTURING INDUSTRY REGULATIONS

CONTENTS (continued)

APPENDIX A

EQUIPMENT LEAK REGULATIONS: SIDE-BY-SIDE COMPARISONS

SUMMARY OF REGULATIONS

General Aspects of Rule	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
APPLICABILITY	All equipment within a process unit in the synthetic organic manufacturing industry that commences construction, reconstruction, or modification after 1/5/81. A list of SOCMI chemicals produced as intermediates or final products by *process units is provided to* determine applicability.	Equipment that is operated in benzene service.	Equipment operated in volatile HAP (VHAP) service after the date for which part 61 regulations *have been promulgated.*	Equipment in organic HAP service operated at least 300 hours per year at facilities for which part 63 regulations have been adopted and that cross-reference this subpart. A list of organic HAP is provided to determine applicability.	Equipment in organic HAP service (see Definitions) operated at least 300 hours per year in the following types of processes: Styrene-butadiene rubber production; polybutadiene rubber production; processes producing *five specific* agricultural chemicals; processes producing six specific types of polymers/resins or other chemicals; pharmaceutical processes using carbon tetrachloride or methylene chloride; and five specified polymers/resins.[a] Specific HAPs are designated for determining applicability.	Equipment at facilities that treat, store, or dispose of hazardous wastes that contains or contacts, hazardous waste with organic concentrations of at least 10 percent by weight that are managed in units *subject to the permitting* requirements of part 270 or hazardous waste recycling units located at such facilities otherwise subject to the permitting requirements of part 270.

General Aspects of Rule	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
EXEMPTIONS	Any affected facility with design capacity to produce *less than 1,000 Mg per* year. Any affected facility that produces heavy liquid chemicals only from heavy liquid feed or raw materials. Any affected facility that produces beverage alcohol. Any affected facility that has no equipment in VOC service. (Must maintain certain records demonstrating exemption applies.)	Coke by-product plants. *Any equipment in benzene* service located at plant designed to produce or use less than 1,000 Mg of benzene per year. Any process unit that has no equipment in benzene service. Exempt from part 60 if subject to part 61.	None specified.	Research and development facilities. Exempt from part 60 and from part 61 if provisions of Part 63 are effective. *Petroleum refining process* units. Ethylene process units. Equipment subject to subpart which does not emit HAPs. CMPUs located at coke by-product recovery plants. Solvent reclamation, *recovery, or recycling* operations at hazardous waste TSDFs that require a 40 CFR part 270 permit that are not part of a SOCMI CMPU.	Facilities that do not have the designated HAP(s) need only document the basis for this determination. Research and development facilities. Exempt until no later than April 22, 1997, if plant site emits less than 10 tpy of any individual HAP and less than 25 tpy of any combination of HAP.	None specified.
DEFINITIONS						
"In gas/vapor service"	The piece of equipment contains process fluid that is in gaseous state at operating conditions.	A piece of equipment contains process fluid that is in the gaseous state at operating conditions.		A piece of equipment in organic hazardous air pollutant (HAP) service contains a gas or vapor at operating conditions.		The piece of equipment contains or contacts a hazardous waste stream that is in the gaseous state at operating conditions.
"In heavy liquid service"	The piece of equipment is not in gas/vapor service or in light liquid service.	Not applicable.		A piece of equipment in organic HAP service is not in gas/vapor service or in light liquid service.		The piece of equipment is not in gas/vapor service or in light liquid service.

General Aspects of Rule	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
DEFINITIONS (continued)						
"In light liquid service"	The piece of equipment contains a liquid that meets the following conditions: 1. The vapor pressure of one or more of the components is greater than 0.3 kPa at 20°C; 2. The total concentration of pure components having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20 percent by weight; and 3. The fluid is a liquid at operating conditions.	Not applicable.		A piece of equipment in organic HAP 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 kPa at 20°C; 2. The total concentration of the pure organic compounds having a vapor pressure greater than 0.3 kPa 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.		The piece of equipment contains or contacts a waste stream that meets the following conditions: 1. The vapor pressure of one or more of the components is greater than 0.3 kPa at 20°C; 2. The total concentration of pure components having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20 percent by weight; and 3. The fluid is a liquid at operating conditions.
"In liquid service"	Not applicable.	A piece of equipment is not in gas/vapor service.		A piece of equipment in organic HAP service is not in gas/vapor service.		Not applicable.
"In VOC service"	The piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight.	The piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight and the piece of equipment is not in heavy liquid service (as defined under 40 CFR part 60, subpart VV).		The piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight and the piece of equipment is not in heavy liquid service (as defined under 40 CFR part 60, subpart VV).		Not applicable.
"In VHAP service"	Not applicable.	A piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight a volatile hazardous air pollutant (VHAP).		Not applicable.		Not applicable.

General Aspects of Rule	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
DEFINITIONS (continued) "In organic hazardous air pollutant or in organic (HAP) service"	Not applicable.	Not applicable.		A piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 5 percent by weight total organic HAP.	A piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 5 percent by weight of the designated organic HAP listed in §63.190(b) of this subpart.	Not applicable.
"In benzene service"	Not applicable.	A piece of equipment contains or contacts a fluid (liquid or gas) that is at least 10% benzene by weight.	Not applicable.	Not applicable.		Not applicable.
Equipment	Each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, and flange or other connector in VOC service and any devices or systems required by this subpart.	Each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, flange or other connector, product accumulator vessel in VHAP service, and any devices or systems required by this subpart.		Each pump, compressor, agitator, pressure relief device, sampling connection system, open-ended valve or line, valve, connector, surge control vessel, bottoms receiver, and instrumentation system in organic HAP service, and any devices or systems required by this subpart.		Each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange or any devices or systems required by this subpart.
Process Unit (hazardous waste management unit for 40 CFR parts 264 and 265)	Components assembled to produce, as intermediate or final products, one or more of the chemicals specified in §60.489. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.	Equipment assembled to produce a VHAP or its derivatives as intermediate or final products, or equipment assembled to use a VHAP in the production of a product. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient product storage facilities.		A chemical manufacturing process unit as defined in subpart F of this part, a process unit subject to the provisions of subpart I of this part, or a process unit subject to another subpart in 40 CFR part 63 that references this subpart.[b]		A contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area.[c]

General Aspects of Rule	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
DEFINITIONS (concluded) Repaired	Equipment is adjusted, or otherwise altered, in order to eliminate a leak as indicated by one of the following: an instrument reading of 10,000 ppm or greater, indications of liquids dripping, or indication by sensor that a seal or barrier fluid has failed.	Equipment is adjusted, or otherwise altered, to eliminate a leak.		Equipment is adjusted, or otherwise altered, to eliminate a leak as defined in the applicable sections of this subpart and unless otherwise specified in the applicable provisions of this subpart, is monitored to verify that emissions are below the applicable leak definition.		Equipment is adjusted, or otherwise altered, to eliminate a leak.
First Attempt at Repair	To take rapid action for the purpose of stopping or reducing leakage of organic material to atmosphere using best practices.	To take rapid action for the purpose of stopping or reducing leakage of organic material to atmosphere using best practices.		To take action for the purpose of stopping or reducing leakage of organic material to atmosphere followed by monitoring to verify that the leak is repaired unless the owner or operator determines by other means that the leak is not repaired.		To take rapid action for the purpose of stopping or reducing leakage of organic material to atmosphere using best practices.
EQUIPMENT IDENTIFICATION (see also Recordkeeping Requirements)	Not specified.	Marked in manner such that it can be readily distinguished from other pieces of equipment.		Marked in manner such that it can be readily distinguished from equipment not subject to this subpart (does not require physical tagging except for leaking equipment).		Marked in manner such that it can be readily distinguished from other pieces of equipment.
COMPLIANCE DEMONSTRATIONS	Performance test required for all equipment within 180 days of initial startup.	Performance test required for all equipment within 180 days of initial startup. For existing sources, shall be in compliance within 90 days after the effective date of the applicable standard. For new sources, shall be in compliance upon effective date of the applicable standard.		Performance test required within 180 days of initial startup. For existing sources, shall be in compliance no later than the following dates: Group I: October 24, 1994 Group II: January 23, 1995 Group III: April 24, 1995 Group IV: July 24, 1995 Group V: October 23, 1995 For new sources, shall be in compliance upon initial startup, or the effective date of the applicable standard.		Not specified.

General Aspects of Rule	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
METHOD OF COMPLIANCE DETERMINATION	Review of records and reports, review of performance test results, and inspections.	Review of records, review of performance test results, and inspections.		Review of records and reports, review of performance test results, and inspections.		Not specified.
REQUIREMENTS WHEN MORE THAN ONE STANDARD APPLIES	Not specified.	A source subject to this subpart that is also subject to *40 CFR part 60 only* will be required to comply with the provisions of this subpart.	A source subject to this subpart that is also subject to *40 CFR part 60 only* will be required to comply with the provisions of this subpart.	Equipment subject to this subpart that are also subject to 40 CFR part 60 or 40 CFR part 61 will be required to comply *only with the provisions of this subpart.*		Any facility subject to this subpart and 40 CFR part 60, subpart VV or 40 CFR part 61, subpart V, may elect to comply with this subpart or the provisions in part 60 or 61 to the extent that the documentation under the regulation at part 60 or part 61 duplicates the documentation required under this subpart.

[a] *Processes producing styrene-butadiene rubber* (butadiene and styrene emissions only). Processes producing polybutadiene rubber (butadiene emissions only). Processes producing the following agricultural chemicals (butadiene, carbon tetrachloride, methylene chloride, and ethylene dichloride emissions only): Captafol (R); Captan (R); Chlorothalonil; Dacthal; and Tordon (R) acid. Processes producing the following polymers/resins and other chemicals (carbon tetrachloride, methylene chloride, tetrachloroethylene, chloroform, and ethylene dichloride emissions only): Hypalon (R); Oxybisphenoxarsine/1,3-diisocyanate [OBPA (R)]; polycarbonates; polysulfide rubber; chlorinated paraffins; and symmetrical tetrachloropyridine. Pharmaceutical production processes using carbon tetrachloride or methylene chloride (carbon tetrachloride and methylene chloride emissions only). Processes producing the following polymers/resins and other chemicals (butadiene emissions only): tetrahydrophthalic anhydride (THPA); methlymethacrylate-butadiene styrene resins (MBS); butadiene-furfural cotrimer; methlymethacrylate-acrylonitrile-butadiene-styrene (MABS) resins; and ethylidene norbornene.

[b] "Chemical manufacturing process unit" means the equipment assembled and connected by pipes or ducts to process raw materials and to manufacture an intended product. A CMPU consists of more than one unit operation. For the purposes of this subpart, chemical manufacturing process unit includes air oxidation reactors and their associated product separators and recovery devices; reactors and their associated product separators and recovery devices; distillation units and their associated distillate receivers and recovery devices; associated unit operations (as defined in this section) and associated recovery devices; and any feed, intermediate, and product storage vessels, product transfer racks, and connected ducts and piping. A chemical manufacturing process unit includes pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, instrumentation systems, and control devices or systems. A chemical process manufacturing unit is identified by its primary product.

[c] Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
VALVES, GAS/VAPOR OR LIGHT LIQUID SERVICE						
Standards	Monitor monthly. After two consecutive months of no leaks, a valve may be monitored quarterly. If leak detected, monitor valve monthly until leak is not detected for two consecutive months.	Monitor monthly. After two consecutive months of no leaks, a valve may be monitored quarterly. If leak detected, monitor valve monthly until leak is not detected for two consecutive months.		In Phases I and II, monitor each valve quarterly. In Phase III, monitoring frequency based on percent valves found leaking: Percent Leaking — Monitoring Frequency ≥ 2 — Monthly or implement a quality implementation plan (QIP) < 2 — Quarterly < 1 — Quarterly or once every 2 quarters 0.5 — Quarterly or once every 4 quarters (If ≥2% leaking valves at a plant site with less than 250 valves in organic HAP service: monitor quarterly.) Existing Sources Phase I: begins on compliance date. Phase II: begins no later than one year after the compliance date. Phase III: begins no later than 2 ½ years after the compliance date.	Monitor monthly. After two consecutive months of no leaks, a valve may be monitored quarterly. If leak detected, monitor valve monthly until leak is not detected for two consecutive months.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR *part 61*, Subpart J	40 CFR *part 61*, Subpart V	40 CFR *part 63*, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
VALVES, GAS/VAPOR OR LIGHT LIQUID SERVICE (conti u						
Standards *(concluded)*				<u>New Sources</u> Phase I: this phase is not applicable. Phase II: begins upon facility startup. Phase III: begins no later than one year after initial startup.		
Leak Definition	10,000 ppm	10,000 ppm		Phase I: 10,000 ppm Phase II: 500 ppm Phase III: 500 ppm		10,000 ppm
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection. When repaired, monitor at least once within first 3 months after repair.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
VALVES, GAS/VAPOR OR LIGHT LIQUID SERVICE (concluded)						
Exemptions	Equipment in vacuum service. "No detectable emissions" valves: less than 500 ppm above background. "Unsafe to monitor" valves: written plan to monitor as frequently as practicable during safe to monitor times. "Difficult to monitor" valves: written plan to monitor at least once per year. No more than 3.0 percent of valves in affected facility can be designated as difficult to monitor.	Equipment in vacuum service. "No detectable emissions" valves: less than 500 ppm above background. "Unsafe to monitor" valves: written plan to monitor as frequently as practicable during safe to monitor times. "Difficult to monitor" valves: written plan to monitor at least once per year.	Equipment in vacuum service. Equipment operated fewer than 300 hours per year. "Unsafe to monitor" valves: written plan to monitor as frequently as practicable during safe to monitor times. "Difficult to monitor" valves: written plan to monitor at least once per year. No more than 3.0 percent of valves in new facility can be designated as difficult to monitor. Equipment located at plant sites with fewer than 250 valves is exempt from monthly monitoring; instead monitor once per quarter or comply with percent leak requirements for < 1% or 0.5%, as applicable.	Equipment in vacuum service. "No detectable emissions" valves: less than 500 ppm above background. "Unsafe to monitor" valves: written plan to monitor as frequently as practicable during safe to monitor times. "Difficult to monitor" valves: written plan to monitor at least once per year. No external activating mechanism in contact with hazardous waste stream; is tested for compliance initially, annually, and as requested by the Regional Administrator Valves designated as difficult to monitor at hazardous waste management units in operation prior to June 21, 1990, and owner/operator follows written plan that requires monitoring of valves at least once per calendar year.		

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
VALVES, HEAVY LIQUID SERVICE						
Standards	Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.	Not applicable.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, audible, olfactory, or other detection method.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, audible, olfactory, or other detection method.
Leak Definition	10,000 ppm	Not applicable.		Monitoring: 500 ppm		10,000 ppm
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Not applicable.		Repair as soon as practicable, no later than 15 calendar after detection. First attempt within 5 calendar days of detection. For equipment that are not monitored (Method 21), repair shall mean that visual, olfactory or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during lead check with soap solution; or system will hold a test pressure.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing	Not applicable.		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing
Exemptions	Equipment in vacuum service.	Not applicable.		Equipment in vacuum service. Equipment operated fewer than 300 hours per year.		Equipment in vacuum service.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
ALTERNATIVE STANDARDS FOR VALVES						
Allowable Percentage of Valves Leaking						
Standard	Allowable percentage of leaking valves is equal to or less than 2.0 percent. Notify Administrator of election to comply with alternative standard. Conduct performance test initially, annually, and at other times as requested by the Administrator. Performance tests shall: • Monitor all valves in gas/vapor and in light liquid service within one week. • Calculate percent leaking.	Notify Administrator of election to comply with alternative standard. Conduct performance test initially, annually, and at other times as requested by the Administrator. Performance tests shall: • Monitor all valves in gas/vapor and in light liquid service within one week. • Calculate percent leaking. • Equal to or less than 2.0 percent leaking. Notify Administrator in writing when owner or operator elects to no longer comply with alternative standard.		Not applicable.		Notify Regional Administrator of election to comply with alternative standard. Conduct performance test initially, annually, and at other times as requested by the Regional Administrator. Performance tests shall: • Monitor all valves in gas/vapor and in light liquid service within one week. • Calculate percent leaking. • Equal to or less than 2.0 percent leaking. Notify Regional Administrator when owner or operator elects to no longer comply with alternative standard.
Leak Definition	10,000 ppm	10,000 ppm		Not applicable.		10,000 ppm
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		Not applicable.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing		Not applicable.		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Skip Period Leak Detection and Repair						
Standard	Notify Administrator of election to comply with alternative standard. Comply initially with monthly LDAR, then either: 1. *After 2 consecutive quarters with equal* to or less than 2 percent leakers, monitor semiannually; or 2. After 5 consecutive quarters with equal to or less than 2 percent leakers, monitor annually. Revert to monthly monitoring if percent leakers exceed 2 percent. Keep record of percent leakers during each leak detection.	Notify Administrator of election to comply with alternative standard. Comply initially with monthly LDAR, then either: 1. *After 2 consecutive quarters with* equal to or less than 2 percent leakers, monitor semiannually. 2. After 5 consecutive quarters with equal to or less than 2 percent leakers, monitor annually. Revert to monthly monitoring if percent leakers exceed 2 percent.	Not applicable.			Notify Regional Administrator of election to comply with alternative standard. Conduct performance test initially, annually, and at other times as requested by the Regional Administrator. Comply initially with monthly LDAR, then either: 1. After 2 consecutive quarters with equal to or less than 2 percent leakers, monitor semiannually. 2. After 5 consecutive quarters with equal to or less than 2 percent leakers, monitor annually. Revert to monthly monitoring if percent leakers exceed 2 percent. Notify Regional Administrator when owner or operator elects to no longer comply with alternative standard.

Specific Component Summaries	REGULATION					
	40 CFR part 60, *Subpart VV*	40 CFR part 61, *Subpart J*	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PUMPS, LIGHT LIQUID SERVICE						
Standards	Pumps: Monitor monthly and conduct weekly visual inspections.	Pumps: Monitor monthly and conduct weekly visual inspections. If located at unmanned plant site, visual inspections required at least monthly.		Pumps: Monitor monthly and conduct weekly visual inspections. If located at unmanned plant site, visual inspections required at least monthly. Phase III: If the greater of either 10 percent of pumps in a process unit (or source-wide) or 3 pumps in a process unit (or source-wide) leak, then implement technology review and improvement QIP. (This does not apply to process unit if more than 90% of the pumps in the unit are either dual mechanical seal or designed with no externally activated shaft penetrating the housing.) Existing Sources Phase I: begins on compliance date. Phase II: begins no later than one year after the compliance date. Phase III: begins no later than 2 ½ years after the compliance date. New Sources Phase I: this phase is not applicable. Phase II: begins upon facility startup. Phase III: begins no later than one year after initial startup.	Pumps: Monitor monthly and conduct weekly visual inspections.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PUMPS, LIGHT LIQUID SERVICE (continued)						
Leak Definition	*10,000 ppm* Indications of liquids dripping from pump seal	10,000 ppm Indications of liquids dripping from pump seal "Dual Mechanical Seal" Pumps: Indications of liquid dripping from pump seal where monitoring for VHAP indicates the presence of VHAP (less background reading) and for monitoring total VOCs measures greater *than 10,000 ppm*		Phase I: 10,000 ppm Phase II: 5,000 ppm Phase III: 5,000 ppm (polymerizing monomers) 2,000 ppm (food/medical services) 1,000 ppm (all other pumps) Indications of liquids dripping from pump seal.		10,000 ppm Indications of liquids dripping from pump seal
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection. Phase III pumps with leak definition of 1,000 ppm: repair only required for pumps leaking at 2,000 ppm or more		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	None specified.	None specified.		Best practices include, but are not limited to: - tightening of packing gland nuts - ensuring that the seal flush is operating at design pressure and temperature		None specified.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PUMPS, LIGHT LIQUID SERVICE (concluded)						
Exemptions	Equipment in vacuum service. Any pump equipped with a compliant closed-vent system and control device. "Dual Mechanical Seal" pumps: specific operating and design requirements. "No Detectable Emissions" pumps: less than 500 ppm above background and specified design requirements.	Equipment in vacuum service. Any pump equipped with a compliant closed-vent system and control device. "Dual Mechanical Seal" pumps: specific operating and design requirements. "No Detectable Emissions" pumps: less than 500 ppm above background and specified design requirements. Any pump located at an unmanned site is exempt from weekly visual inspections and daily sensor checks, provided each pump is inspected as often as practicable and at least monthly.		Equipment in vacuum service. Any pump equipped with a compliant closed-vent system that transports leakage back to the process, fuel gas system, or to a compliant control device. "Dual Mechanical Seal" pumps: specific operating and design requirements. "No Detectable Emissions" pumps: less than 500 ppm above background and specified design requirements. No external shaft penetrating the pump housing: weekly visual inspection. Equipment operated fewer than 300 hours per year. Process units with more than 90% of pumps with dual mechanical seal or closed-vent system are exempt from monthly calculations of percent leaking pumps. If at unmanned site, visually inspect as often as practicable and at least monthly. Unsafe to monitor pumps are exempt if monitoring personnel would be exposed to an immediate danger and owner/operator has a plan that requires monitoring as often as practical during safe to monitor times, but not more frequently than the periodic monitoring schedule otherwise applicable.		Equipment in vacuum service. Any pump equipped with a compliant closed-vent system and control device. "Dual Mechanical Seal" pumps: specific operating and design requirements. "No Detectable Emissions" pumps: less than 500 ppm above background and specified design requirements.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PUMPS, HEAVY LIQUID SERVICE						
Standards	Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.	Not applicable.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.
Leak Definition	10,000 ppm	Not applicable.		Monitoring: 2,000 ppm, unless handling polymerizing monomers - 5,000 ppm.		10,000 ppm
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Not applicable.		Repair as soon as practicable, no later than 15 calendar after detection. First attempt within 5 calendar days of detection. For equipment that are not monitored (Method 21), repair shall mean that visual, olfactory or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during lead check with soap solution; or system will hold a test pressure.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing	Not applicable.		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing
Exemptions	Equipment in vacuum service.	Not applicable.		Equipment in vacuum service. Equipment operated fewer than 300 hours per year.		Equipment in vacuum service.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PRESSURE RELIEF DEVICES, GAS/VAPOR SERVICE						
Standards	No detectable emissions, except during pressure releases (less than 500 ppm above background). *After each release, return to no detectable* emissions within 5 calendar days as indicated by monitoring of the pressure relief device.	No detectable emissions (less than 500 ppm *above background*). After each release, return to no detectable emissions within 5 calendar days as indicated by monitoring of the pressure relief device.		<u>No Rupture Disk</u> No detectable emissions (less than 500 ppm above background) After each release, return to no detectable emissions within 5 calendar days as indicated by monitoring of the pressure relied device. <u>With Rupture Disk</u> After each release, replace rupture disk within 5 calendar days.		No detectable emissions (less than 500 ppm above background). After each release, return to no detectable emissions within 5 calendar days as indicated by monitoring of the pressure relief device.
Leak Definition	"No detectable emissions" - less than 500 ppm above background.	"No detectable emissions" - less than 500 ppm above background.		*"No detectable emissions" - less than 500* ppm above background.		*"No detectable emissions" - less than 500* ppm above background.
Repair	Return to condition of "no detectable emissions" as soon as practicable but no later *than 5 calendar days after pressure release.*	Return to condition of "no detectable emissions" as soon as practicable but no later than 5 calendar days after pressure release.		Not applicable.		Return to condition of "no detectable emissions" as soon as practicable but no later than 5 calendar days after pressure release.
Exemptions	Pressure relief devices equipped with closed-vent system and control device. Equipment in vacuum service.	Pressure relief devices equipped with compliant closed-vent system and control device. Equipment in vacuum service.		*Pressure relief devices routed to a process or* fuel gas system or equipped with compliant closed-vent system and control device. Equipment in vacuum service. Equipment operated fewer than 300 hours per year. Any pressure relief device equipped with a *rupture disk meeting the requirements* of the rule.		*Pressure relief devices* equipped with compliant closed-vent system and control device. Equipment in vacuum service.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PRESSURE RELIEF DEVICES, LIGHT LIQUID OR HEAVY LIQUID SERVICE						
Standards	Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.	Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, auditory, olfactory, or other detection method.
Leak Definition	10,000 ppm	10,000 ppm		Monitoring: 500 ppm		10,000 ppm
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		Repair as soon as practicable, no later than 15 calendar after detection. First attempt within 5 calendar days of detection. For equipment that are not monitored (Method 21), repair shall mean that visual, olfactory or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during lead check with soap solution; or system will hold a test pressure.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - *injection of lubricant into lubricated* packing		Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated *packing*		
Exemptions	Equipment in vacuum service.	Equipment in vacuum service.		Equipment in vacuum service. Equipment operated fewer than 300 hours per year.		Equipment in vacuum service.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
COMPRESSORS						
Standards	Equip with compliant seal system that includes a barrier fluid system and that prevents leakage to atmosphere. Seal system shall meet certain design and operation requirements. Install sensor to detect failure of seal system, barrier fluid system, or both. Check sensor daily or equip with audible alarm. Establish criteria that indicates failure of seal system, barrier *fluid system, or both.*	Equip with seal system that includes a barrier fluid system and that prevents leakage to atmosphere. Seal system shall meet certain design and operation requirements. Install sensor to detect failure of seal system, barrier fluid system, or both. Visually check sensor daily or equip with audible alarm (unless located at unmanned plant site). Establish criteria that indicates failure of *seal system, barrier fluid system,* or both.		Equip with seal system that includes a barrier fluid system and that prevents leakage to atmosphere. Seal system shall meet certain design and operation requirements. Install sensor to detect failure of seal system, barrier fluid system, or both. Check sensor daily or equip with audible alarm that is checked monthly (unless located *at unmanned plant site, then* check daily). Establish criteria that indicates failure of seal system, barrier fluid system, or both.		Equip with seal system that includes a barrier fluid system and that prevents leakage to atmosphere. Seal system shall meet certain design and operation requirements. Install sensor to detect failure of seal system, barrier fluid system, or both. Check sensor daily or equip with audible alarm that is checked monthly; if at unmanned plant site, check daily. Establish criteria that indicates failure of seal system, barrier fluid system, or both.
Leak Definition	*Sensor indicates failure of seal system,* barrier fluid system, or both based on established criteria.	Sensor indicates failure of seal system, barrier fluid system, or both based on established criteria.		Sensor indicates failure of seal system, barrier fluid system, or both based on established criteria.		Sensor indicates failure of seal system, barrier fluid system, or both based on established criteria.
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.

Component Summaries	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
COMPRESSOR (concluded)						
Exemptions	Equipment in vacuum service. Compressors equipped with compliant closed-vent system and control device. Compressors designed to operate with an instrument reading less than 500 ppm above background. Reciprocating compressors that meet certain criteria.	Equipment in vacuum service. Compressors equipped with compliant closed-vent system and control device. Compressors designed to operate with an instrument reading less than 500 ppm above background.		Equipment in vacuum service Any compressors equipped with compliant closed-vent system that returns to process, fuel gas system, or transports leakage back to the process or to a compliant control device. Compressors designed to operate with an instrument reading less than 500 ppm above background. Compressors operated fewer than 300 hours per year in organic HAP service.	Equipment in vacuum service. Compressors equipped with compliant closed-vent system and control device. Compressors designed to operate with an instrument reading less than 500 ppm above background.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB *40 CFR part 265*, Subpart BB
SAMPLING CONNECTION SYSTEMS						
Standards	Equipped with closed-purge, closed-loop, or closed-vent system that returns the purged process fluid to the process line, collects and recycles the purged process fluid to a process, or is designed and operated to *capture and transport all the purged process* fluid to a compliant control device.	Equipped with closed-purge system or closed-vent system that either returns the fluid to the process line or collects and recycles the purged fluid with zero VHAP emissions to the atmosphere, or captures and transports all purged fluids to a compliant control device.		Equipped with closed-purge system, closed-loop, or closed-vent system that either returns the fluid to the process, recycles the purged fluid, send it to a compliant control device, or collect, store, and transport it to an appropriate facility. Gases displaced during filling of samples are not required to be collected or captured.		Equipped with closed-purge system or closed-vent system that either returns the *fluid to the process line or collects and* recycles the purged fluid with zero VHAP emissions to the atmosphere, or captures and transports all the purged hazardous waste stream to a compliant control device.
Leak *Definition*	Not applicable.	Not applicable.		Not applicable.		Not applicable.
Repair	Not applicable.	Not applicable.		Not applicable.		Not applicable.
Exemptions	Equipment in vacuum service. In-situ sampling systems and sampling systems without purges.	Equipment in vacuum service. In-situ sampling systems.		Equipment in vacuum service. In-situ sampling systems and sampling systems without purges. Equipment operated fewer than 300 hours per year.		Equipment in vacuum service. In-situ sampling systems. Sampling systems without purges.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
OPEN-ENDED VALVES OR LINES						
Standards	Equip with cap, blind flange, plug, or second valve to seal open end at all time except when operations require flow through open end. Second Valve Close valve on process fluid end before closing second valve Double Block and Bleed System Bleed valve or line may remain open during operations that require venting the line between the block valves, but comply with basic standard at all other times.	Equip with cap, blind flange, plug, or second valve to seal open end at all time except when operations require flow through open end. Second Valve Close valve on process fluid end prior to closing second valve Double Block and Bleed System May remain open during operations that require venting the line between the block valves, but comply with basic standard at all other times.		Equip with cap, blind flange, plug, or second valve to seal open end at all time except when operations require flow through open end or during maintenance and repair. Second Valve Close valve on process fluid end prior to closing second valve Double Block and Bleed System May remain open during operations that require venting the line between the block valves, but comply with basic standard at all other times.		Equip with cap, blind flange, plug, or second valve to seal open end at all time except when operations require flow through open end. Second Valve Close valve on hazardous waste stream end prior to closing second valve Double Block and Bleed System May remain open during operations that require venting the line between the block valves, but comply with basic standard at all other times.
Leak Definition	Not applicable.	Not applicable.		Not applicable.		Not applicable.
Repair	Not applicable.	Not applicable.		Not applicable.		Not applicable.
Exemptions	Equipment in vacuum service.	Equipment in vacuum service.		Equipment in vacuum service. Open-ended valves and lines in an emergency shutdown system that are designed to open automatically in the event of a process upset. Equipment operated fewer than 300 hours per year. Equipment containing materials which would automatically polymerize or cause a safety hazard if capped or equipped with a double block and bleed system.		Equipment in vacuum service.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
FLANGES AND OTHER CONNECTORS (ALL SERVICES)						
Standards	Monitor within 5 days if evidence of a potential leak is found by visual, auditory, olfactory, or other detection methods.	Monitor within 5 days if evidence of a potential leak is found by visual, auditory, olfactory, or other detection methods.		(see Connectors, gas/vapor or light liquid service)		Monitor within 5 days if evidence of a potential leak is found by visual, auditory, olfactory, or other detection methods.
Leak Definition	10,000	10,000		(see Connectors, gas/vapor or light liquid service)		10,000
Repair	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.	Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.		(see Connectors, gas/vapor or light liquid service)		Repair as soon as practicable, no later than 15 calendar days after detection. First attempt within 5 calendar days of detection.
First Attempt at Repair Practices	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing	Best practices include, but are not limited to: - tightening of bonnet bolts - replacement of bonnet bolts - tightening of packing gland nuts - injection of lubricant into lubricated packing		(see Connectors, gas/vapor or light liquid service)		
Exemptions	Equipment in vacuum service.	Equipment in vacuum service.		(see Connectors, gas/vapor or light liquid service)		Equipment in vacuum service.

Specific *Component* Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
CONNECTORS, GAS/VAPOR OR LIGHT LIQUID SERVICE						
Standards	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Initial Survey: Monitor all connectors within a 12 month period Subsequent monitoring frequency based on percent leaking connectors: • annual if ≥ 0.5% • once every 2 years if < 0.5% • once every 4 years if <0.5% during 2 year monitoring • once every 2 years if 0.5 to <1% during 4 year monitoring • annual if >1% during 4 year monitoring To comply with monitoring frequency of once every two years, monitor at least 40% of the connectors in the first year and the remainder in the second year. To comply with monitoring frequency of once every four years, monitor at least 20% each year until all have been monitored within 4 years. Connectors that have been opened or reconnected or have had the seal broken: Monitor for leaks within 3 months after being returned to organic HAP service or calculate percent leakers by setting nonreparable components to zero for all monitoring periods. May switch between these alternatives at end of monitoring period. A switch in alternatives requires initial monitoring no later than 12 months after reporting the switch.	(see "Flanges and other connectors, all services)

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
CONNECTORS, GAS/VAPOR OR LIGHT LIQUID SERVICE (concluded)						
Leak Definition	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		500 ppm (except for inaccessible, ceramic, or ceramic-lined connectors)		(see "Flanges and other connectors, all services)
Repair	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Repair as soon as practicable, but no later than 15 calendar days after detection. First attempt to repair within 5 calendar days of detection. When repaired, monitor at least once within first 3 months of repair.		(see "Flanges and other connectors, all services)
Exemptions	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Equipment in vacuum service. Equipment operated fewer than 300 hours per year. "Unsafe to monitor" connectors: Written plan to monitor as frequently as practicable during safe to monitor periods, but no more frequently than the periodic schedule otherwise applicable. "Unsafe to repair" connectors: Repair by end of the next scheduled process unit shutdown. "Inaccessible" or "ceramic" or "ceramic-lined" connectors: Repair any observed leak.		(see "Flanges and other connectors, all services)

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
CONNECTORS, HEAVY LIQUID SERVICE						
Standards	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, audible, olfactory, and other detection methods.		(see "Flanges and other connectors, all services)
Leak Definition	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Monitoring: 500 ppm		(see "Flanges and other connectors, all services)
Repair	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Repair as soon as practicable, no later than 15 calendar after detection. For connectors in heavy liquid service that are not monitored (Method 21), repair shall mean that visual, audible, olfactory, or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during leak check with soap solution; or system will hold a test pressure.		(see "Flanges and other connectors, all services)
Exemptions	(see "Flanges and other connectors, all services)	(see "Flanges and other connectors, all services)		Equipment in vacuum service. Equipment operated fewer than 300 hours per year.		(see "Flanges and other connectors, all services)

Specific *Component* Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
AGITATORS, GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE						
Standards	Not applicable.	Not applicable.		"Non Dual Mechanical Seal" Agitators *Monthly monitoring and weekly visual check* for indications of dripping liquid. If at unmanned site, visually inspect as often as *practicable and at least monthly*. "Dual Mechanical Seal" Agitators Daily sensor check and weekly visual inspections for indications of dripping liquid. Dual mechanical seal requirements: • Barrier fluid pressure at all times greater than agitator stuffing box pressure, or • Barrier fluid degassing reservoir routed to a process or fuel gas system or connected by a compliant closed-vent system to a control device, or • Closed-loop system that purges the barrier fluid into a process stream. Owner/operator determines 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.	Not applicable.
AGITATORS, GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE (concluded)						

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Leak Definition	Not applicable.	Not applicable.		"Non Dual Mechanical Seal" Agitators: *Monthly monitoring: 10,000 ppm* Weekly Visual: presence of indications of dripping liquids "Dual Mechanical Seal" Agitators: Weekly Visual: if indications of dripping liquids, monitor and if reading is 10,000 ppm based or higher, a leak is detected. Drip Criteria: A leak is detected if the drip *criteria established are exceeded.* Sensor: A leak is detected if the sensor indicates failure of the seal system, the barrier fluid system, or both.		Not applicable.
Repairs	Not applicable.	Not applicable.		Repair as soon as practicable, no later than 15 days after detection. *First attempt to repair within 5 calendar days of detection.*		*Not applicable.*

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Exemptions	Not applicable.	Not applicable.		Designed with no externally actuated shaft penetrating the agitator housing. Equipment in vacuum service. Agitators operated fewer than 300 hours per year in organic HAP service. Any agitator equipped with a compliant closed-vent system and control device. "Difficult to monitor" agitators: less than 3% or agitators may be so marked. "Unsafe to monitor" agitators: written plan to monitor as frequently as practicable during safe to monitor periods, but no more frequently than the periodic schedule otherwise applicable. Agitators obstructed by equipment piping that *prevents* access by a monitor probe. Agitators located at unmanned plant sites are *exempt from* weekly visual inspection and daily sensor check if visually inspected as often as possible and at least monthly.		Not applicable.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
AGITATORS, HEAVY LIQUID SERVICE						
Standards	Not applicable.	Not applicable.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, audible, olfactory, or other detection method.		Not applicable.
Leak Definition	Not applicable.	Not applicable.		Monitoring: 10,000 ppm		Not applicable.
Repair	Not applicable.	Not applicable.		Repair as soon as practicable, no later than 15 calendar after detection For agitators in heavy liquid service that are not monitored (Method 21), repair shall mean that visual, audible, olfactory, or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during leak check with soap solution; or system will hold a test pressure.		Not applicable.
Exemptions	Not applicable.	Not applicable.		Equipment in vacuum service. Equipment operated fewer than 300 hours per year.		Not applicable.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
INSTRUMENTATION SYSTEMS						
Standards	Not applicable.	Not applicable.		Monitoring of potential leaks within 5 calendar days of detection if evidence of potential leak is found by visual, audible, olfactory, or other detection method.		Not applicable.
Leak Definition	Not applicable.	Not applicable.		Monitoring: 500 ppm		Not applicable.
Repair	Not applicable.	Not applicable.		Repair as soon as practicable, no later than 15 calendar after detection. For instrumentation systems that are not monitored (Method 21), repair shall mean that visual, audible, olfactory, or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during leak check with soap solution; or system will hold a test pressure.		Not applicable.
Exemptions	Not applicable.	Not applicable.		Equipment in vacuum service. Equipment operated fewer than 300 hours per year.		Not applicable.

Specific *Component* Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	*40 CFR part 61,* Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
PRODUCT ACCUMULATOR VESSELS						
Standards	Not applicable.	Compliant closed-vent system and control device.		(see Surge Control Vessels and Bottoms Receivers)		Not applicable.
Leak *Definition*	Not applicable.	Not applicable.		(see Surge Control Vessels and Bottoms Receivers)		Not applicable.
Repair	Not applicable.	Not applicable.		(see Surge Control Vessels and Bottoms Receivers)		Not applicable.
Exemptions	Not applicable.	Equipment in vacuum service.		(see Surge Control Vessels and Bottoms Receivers)		Not applicable.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
SURGE CONTROL VESSELS AND BOTTOMS RECEIVERS						
Standards	Not applicable.	(see Product Accumulator Vessels)		Use of closed-vent system that routes the organic vapors either back to process or to compliant control device. Comply with the requirements for fixed roofs with internal or external floating roofs.		Not applicable.
Leak Definition	Not applicable.	(see Product Accumulator Vessels)		Not applicable.		Not applicable.
Repair	Not applicable.	(see Product Accumulator Vessels)		Not applicable.		Not applicable.
Exemptions	Not applicable.	(see Product Accumulator Vessels)		Surge control vessels routed back to process. Equipment in vacuum service. Equipment operated fewer than 300 hours per year. Surge control vessels that do not meet certain capacity and vapor pressure criteria; see Tables 2 and 3 of Subpart H.		Not applicable.

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
CLOSED VENT SYSTEMS AND CONTROL DEVICES						
Standards	Control devices and closed-vent systems to be operated at all times that emissions may be vented to them. <u>Control Devices</u> *Vapor recovery systems:* 95 *percent or* greater recovery Combustion devices: 95 percent or greater reduction or minimum residence time of 0.75 seconds and minimum temperature of 816°C. Flares: Comply with §60.18 <u>Closed-Vent Systems (CVS)</u> Hard pipe construction: Initial inspection (Method 21) and then annual visual inspections. Ductwork construction: Initial and annual inspections using Method 21. Does not apply if CVS is in vacuum service.	Control devices and closed-vent systems to be operated at all times that emissions may be vented to them. <u>Control Devices</u> *Vapor recovery systems:* 95 percent or greater recovery Combustion devices: 95 percent or greater reduction or minimum residence time of 0.50 seconds and minimum temperature of 760°C. Flares: Comply with §60.18 <u>Closed-Vent Systems (CVS)</u> No detectable emissions (less than 500 ppm above background) and no visual indications.		Control devices and closed-vent systems to be operated at all times that emissions may be vented to them. Control devices subject to 40 CFR 63 subpart H and 40 CFR 264 subpart BB or 40 CFR *265 subpart BB may comply with the* monitoring, recordkeeping and reporting requirements of subpart H or of parts 264 and/or 265. <u>Recovery or Recapture Devices:</u> Vapor recovery systems: 95 percent or greater recovery or an exit concentration of 20 ppmv, whichever is less stringent. Combustion devices: 95 percent or greater reduction or 20 ppmv on any basis, corrected to 3% O_2, whichever is less stringent; or minimum residence time of 0.50 seconds and minimum temperature of 760°C. Flares: Comply with §63.11(b). <u>Closed-Vent Systems (CVS)</u> Hard pipe construction: Initial inspection (Method 21) and then annual visual inspections. Ductwork construction: Initial and annual inspections using Method 21. Does not apply if CVS is in vacuum service.		Control devices and closed-vent systems to be operated at all times that emissions may be vented to them. <u>Control Devices</u> *Vapor recovery systems:* 95 *percent or* greater recovery unless total organic emission limits of 1.4 kg/hr (12.8 Mg/yr) for all affected processes can be attained at an efficiency of less than 95 percent. For carbon adsorbers, carbon replacement intervals specified. Combustion devices: 95 percent or greater reduction; 20 ppmv total organic compound *concentration; or minimum residence time of* 0.50 seconds and minimum temperature of 760°C. Boilers and process heaters: Introduce vent stream into flame combustion zone. Flares: Flame present at all times, no visible emissions (except for periods not to exceed a total of 5 minutes during any 2 consecutive hours), basic requirements for heat content *and exit velocities.* <u>Closed-Vent Systems (CVS)</u> No detectable emissions (less than 500 ppm above background).

Specific Component Summaries	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
CLOSED VENT SYSTEMS AND CONTROL DEVICES (continued)						
Monitoring	Control Devices: Monitor to ensure operated and maintained in conformance with their designs. Closed-Vent Systems: If contains by-pass lines, (1) vent stream flow meters or (2) car-seal or lock-and-key type of configuration with monthly visual inspection required. Inspect initially, annually, and at other times as requested by the Administrator. Hard pipe construction: Method 21 for initial inspection, annual visual inspections. Duct Work construction: Method 21 for initial and annual inspections.	Control Devices: Monitor to ensure operated and maintained in conformance with their designs. Closed-Vent Systems: Initially, annually, and at other times as requested by the Administrator.		Control Devices: Monitor to ensure operated and maintained in conformance with their designs. Closed-Vent Systems: If contains by-pass lines: install, set or adjust and maintain vent stream flow indicator installed at entrance to any bypass line or (1)vent stream flow meters or (2) car-seal or lock-and-key type of configuration with monthly visual inspection required.		Control Devices: Monitor to ensure operated and maintained in conformance with their designs. Specific requirements identified for vent stream flow monitors and other monitors for specific types of control devices. Closed-Vent Systems: Initially, annually, and at other times as requested by the Administrator.
Leak Definition	> 500 ppm or above background Visual inspection	500 ppm Visual inspection		500 ppm Visual inspection		CVS: detectable emissions (≥500 above background)
Repair	Repair as soon as practicable, but no later than 15 calendar days after detection. First attempt to repair within 5 calendar days of detection.	Repair as soon as practicable, but no later than 15 calendar days after detection. First attempt to repair within 5 calendar days of detection.		Repair as soon as practicable, but no later than 15 calendar days after detection. First attempt to repair within 5 calendar days of detection.		Repair as soon as practicable, but no later than 15 calendar days after detection. First attempt to repair within 5 calendar days of detection.

Specific Component *Summaries*	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, *Subpart J*	40 CFR part 61, *Subpart V*	40 CFR part 63, *Subpart H*	40 CFR part 63, *Subpart I*	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
CLOSED VENT SYSTEMS AND CONTROL DEVICES (concluded)						
Exemptions	Equipment in vacuum service. "Unsafe to inspect" parts: inspect as frequently as practicable during safe to inspect times. "Difficult to inspect" parts: inspect at least once every 5 years.	Equipment in vacuum service.		Equipment in vacuum service. "Unsafe to inspect" parts: inspect as *frequently as practicable but not more than* once per year. "Difficult to inspect" parts: inspect at least once every 5 years. Equipment in organic HAP service fewer than 300 hours per year. Equipment needed for safety purposes are not subject to these monitoring requirements.		Equipment in vacuum service. Equipment that contains or contacts a hazardous waste of at least 10% by weight for fewer than 300 hours per year. "Unsafe to monitor" parts: monitor as frequently as possible during safe to monitor times.

	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	Subpart BB
	Allowed if repair is technically infeasible without a process unit shutdown. Repair to occur before end of next process unit shutdown. *Allowed for equipment isolated from the* process and that does not remain in VOC service.	Allowed if repair is technically infeasible *without a process unit shutdown.* Repair to occur before end of next process unit shutdown. *Allowed for* **equipment isolated from the process and that does not remain in VHAP service.**		Allowed if repair is technically infeasible without a process unit shutdown. Repair to occur before end of next process unit shutdown. Allowed for equipment isolated from the process and that does not remain in organic HAP service.		
Valves (including connectors and agitators for 40 *CFR part 63* only)	Allowed if: Emissions of purged material resulting from immediate repair greater than the fugitive *emissions likely to result from the delay* in the repair and purged material is collected and destroyed or recovered in compliant control device when procedures are *effected.* Delay beyond a process unit shutdown allowed if valve assemblies have been depleted and valve assembly supplies had been sufficiently stocked before supplies were depleted. Not allowed beyond next process unit shutdown, unless next process unit shutdown occurs sooner than 6 months after *first process unit shutdown.*	Allowed if: Emissions of purged material resulting from immediate repair greater than the fugitive emissions likely to result from the delay in the repair and purged material is collected and destroyed or recovered in compliant control device when procedures are *effected.* Delay beyond a process unit shutdown allowed if valve assemblies have been depleted, valve assembly supplies had been sufficiently stocked before supplies were depleted. Not allowed unless next process unit shutdown occurs sooner than 6 months after first process unit shutdown.		Allowed if: Emissions of purged material resulting from immediate repair greater than the fugitive emissions likely to result from the delay in the repair and purged material is collected and destroyed or recovered in compliant control device when procedures are effected. Delay beyond a process unit shutdown allowed if valve assemblies have been depleted, valve assembly supplies had been sufficiently stocked before supplies were depleted. Not allowed beyond the second process unit shutdown unless the third process unit shutdown occurs sooner than 6 months after first process unit shutdown.		Emissions of purged material resulting from immediate repair greater than the fugitive emissions likely to result from the delay in the repair and purged material is collected and destroyed or recovered in compliant control device when procedures are effected. Delay beyond a hazardous waste management unit shutdown allowed if valve *assemblies have been depleted, valve* assembly supplies had been sufficiently stocked before supplies were depleted. Not allowed unless next unit shutdown occurs sooner than 6 months after first unit shutdown.

Delay of Repair	REG' 1				
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Pumps	Allowed if: Repair requires use of DMS seal system that includes barrier fluid and Repair completed as soon as practicable, but not later than 6 months after leak was detected.	Allowed if: Repair requires use of DMS seal system that includes barrier fluid and Repair completed as soon as practicable, but not later than 6 months after leak was detected.		Allowed if: Repair requires replacing existing seal design with a new system that provides better performance under provisions of a QIP or using a DMS, a pump designed with no externally actuated shaft, or a compliant closed-vent system and control device. Repair completed as soon as practicable, but not later than 6 months after leak was detected.		Allowed if: Repair requires use of DMS seal system that includes barrier fluid and Repair completed as soon as practicable, but not later than 6 months after leak was detected.
Closed-Vent Systems and Control Devices	Allowed if emissions resulting from delay of repair would be greater than fugitive emissions from delay of repair. Repair required by end of next process unit shutdown.	Not applicable.		Allowed if emissions resulting from delay of repair would be greater than fugitive emissions from delay of repair. Repair required by end of next process unit shutdown.		Allowed if emissions resulting from delay of repair would be greater than fugitive emissions from delay of repair. Repair required by end of next process unit shutdown.

Quality Improvement Programs	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Applicability	Not applicable.	Not applicable.		<u>Valves</u> Optional in phase III to owners\operators with $\leq$2% leakers. Decision required within first year of phase III. If rolling average of percent leakers is <2% for 2 consecutive quarters: (1) comply with QIP, (2) comply with §63.168, or (3) comply with both QIP and §63.168. If comply with §63.168 only, can not use QIP again if leak rate goes above 2 percent; monthly monitoring is required. If not continuing QIP (i.e., complying with valve standard) *cannot* use QIP again if leak rate goes above 2%; monthly monitoring is required. If complying with both QIP and valve standard, owner/operator may use the following monitoring frequencies: - if <2% leaking, then monitor once per quarter - if <1% leaking, then once every 2 quarters - if <0.5% leaking, then once every 4 quarters <u>Pumps</u> Required in phase III if 6 month rolling average is the greater of either >10% or 3 pumps leaking. Once <10% or <3 pumps (6 month rolling average) leaking is achieved, comply with §63.163. If leak rate again exceeds the greater of either >10% or 3 pumps leaking, can use QIP again.		Not applicable.

Quality Improvement Programs	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Valves, Demonstration of Further Progress	Not applicable.	Not applicable.		Comply with valve standard except monitor quarterly. Collect data and maintain records as follows: • maximum instrument reading observed in each monitoring observation before repair, response factor for each stream, instrument model number, and date of observation • classification of valve "gas or light liquid service" • repair method used and instrument readings after repair (monitoring required at least once within the first 3 months after the repair is completed)*(ID tag on a* leaking valve may be removed after the valve successfully passes this monitoring period) Continue to collect data on the valves for as long as the process unit is in QIP Demonstrate progress in reducing the percent leaking valves each quarter by at least: • 10 percent (meaning that each quarter there is at least a 10 percent reduction in the percent leaking valves from *the preceding monitoring period)* [calculation to be made by formula specified in §63.175(d)(4)(i)], or • *alternative quarterly percent reduction* [calculated according to the equation in §63.175(d)(4)(iii)(A)] and to less than 2 percent within 2 years. The provisions for failure to meet the 10 percent reduction for 2 consecutive rolling averages are: • a choice of monthly monitoring, or • implementation of a QIP for technology review as specified in §63.175(e).	

Quality Improvement Programs	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Valves, Technology Review and Improvement	Not applicable.	Not applicable.		Data collection for the valves as long as in QIP: • Valve type and manufacturer, valve design, materials of construction, packing material, and year installed. • Service characteristics of the stream (e.g., operating pressure, temperature, line diameter, corrosivity). • Whether in gas/vapor or light liquid service. • If a leak is detected, the maximum instrument reading observed before a repair, response factor for stream if adjusted, instrument model number, and date of observation. • If a leak is repaired, repair methods used and the instrument readings after the repair. Inspect all valves removed due to leaks to determine cause of failure and recommend design and other changes to reduce leak potential. Analyze data to determine the services, operating and *maintenance procedures, and valve designs or technologies* that have poorer than average emission performance and those that have better than average emission performance. The first analysis shall be completed no later than 18 months after the start of Phase III, shall use a minimum of 6 months of data, shall be done yearly for as long as the process unit is in the QIP program. Superior valve performance is defined as: • technology for valves having a leak frequency of $<2\%$ for specific applications in process unit. • technology has low emission performance and is capable of achieving $<2\%$ leaking valves in process unit.	Not applicable.

Quality Improvement Programs	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Valves, Technology Review and Improvement (concluded)	Not applicable.	Not applicable.		Trial evaluation program is required for plants that have not demonstrated superior performing valve designs and technologies: 1. The number of valves in the trial program shall be the lesser of 1 percent or 20 valves for programs involving single process units and the lesser of 1 percent or 50 valves for programs involving groups of process units. 2. The program shall specify and include design documentation of: • superior performing valve designs or technologies • stages of evaluating these valve designs or technologies • frequency of monitoring or inspection • range of operating conditions component will be evaluated under • conclusions regarding the emission performance and appropriate operating conditions and services The performance trials shall be conducted for a 6-month period beginning no later than 18 months after the beginning of the QIP. Conclusions will be drawn no later than 24 months after the beginning of the QIP. Any plant site with fewer than 400 valves and owned by a company with fewer than 100 total employees is exempt from the trial evaluations of valves. These exempted plants shall begin the program at the start of the fourth year of Phase III. If superior emission performance technology can not be identified, replacement valve shall be one with lowest emission performance technologies identified for the specific application.		Not applicable.

Quality Improvement Programs	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Pumps, Technology Review and Improvement	Not applicable.	Not applicable.		Data collection: • Pumps: type and manufacturer, seal type and manufacturer, *pump design, materials of construction,* barrier fluid or packing material, and year installed. • *Service characteristics* of the stream, discharge pressure, temperature, flow rate, corrosivity, and annual operating hours. • Maximum instrument readings observed before repair, response factor for the stream, instrument number, and date of observation. • If a leak is detected, repair methods used and the instrument readings after the repair. Inspect all pumps or pump seals that exhibit frequent seal failure and were removed due to leaks. Inspection shall determine probable cause and recommendation for design changes or changes in specifications to reduce leak potential. Analyze data to *determine the services, operating* and maintenance procedures, and pumps and pump seal designs or technologies that have poorer than average emission *performance* and those that have better than average emission performance. The first analysis shall be completed no later than 18 months after the start of the program, shall use a minimum of 6 months of data, shall be done yearly for as long as the process *unit is in the QIP* program.		Not applicable.

Quality Improvement Programs	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Pumps, Technology Review and Improvement (concluded)	Not applicable.	Not applicable.		Superior pump performance is defined as: • pumps or pump seals that will result in < 10% leaking pumps in the process unit. • includes material or design changes to the existing pump, pump seal, seal support system, installation of multiple mechanical seals or equivalent, or pump replacement. Trial evaluation program is required for plants that have not demonstrated superior technologies: 1. The number of pump seal technologies or pumps in the trial program shall be the lesser of 1 percent or 2 pumps for programs involving single process units and the lesser of 1 percent or 5 pumps for plant sites or groups of process units. The minimum number of pumps or pump seal technologies in the program shall be 1; and 2. The program shall specify and include design documentation of the following: • superior performing pump seal designs or technologies • stages of evaluating these pump designs or pump seal technologies • frequency of monitoring or inspection • range of operating conditions component will be evaluated under • conclusions regarding the emission performance and appropriate operating conditions and services The performance trials shall be conducted for a 6-month period beginning no later than 18 months after the beginning of the QIP. Conclusions will be drawn no later than 24 months after the beginning of the QIP. Beginning at the start of the third year of the QIP for plants with 400 or more valves or 100 or more employees and at the start of the fourth year for others, the owner/operator shall replace the pumps and pump seals that are not superior technology. Pumps or pump seals shall be replaced at the rate of 20 % per year and shall continue to be replaced until all are superior technology.		Not applicable.

Equivalence of (or Alternative) Means of Emission Limitation: General	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Equipment, Design, and Operational Requirements	Owner/operator collect and verify test data to demonstrate equivalence. Administrator compares test data. Administrator may condition approval.	Owner/operator collect and verify test data for alternative means of emission limitation. Administrator may condition approval.		Owner/operator collect and verify test data for alternative means of emission limitation. Administrator compares test data. Administrator may condition approval.		Not applicable.
Work Practices	Owner/operator collect and verify test data to demonstrate equivalence. Owner/operator demonstrates emission reduction achieved by required work practice. Owner/operator demonstrates emission reduction achieved by equivalent means of emission limitation. Owner/operator commits to alternative work practices. Administrator compares demonstrated emission reductions. Administrator may condition approval.	Owner/operator collect and verify test data for alternative means of emission limitation. Owner/operator demonstrates emission reduction achieved by required work practice (for minimum of 12 months). Owner/operator demonstrates emission reduction achieved by alternative means of emission limitation. Owner/operator commits in writing to work practices that provide for emission reductions equal to or greater than emission reductions achieved by required work practices. Administrator compares demonstrated emission reductions. Administrator may condition approval.		Owner/operator collect and verify test data for alternative means of emission limitation. Owner/operator demonstrates emission reduction achieved by required work practice (for minimum of 12 months). Owner/operator demonstrates emission reduction achieved by alternative means of emission limitation. Owner/operator commits to alternative work practices. Administrator compares demonstrated emission reductions. Administrator may condition approval.		Not applicable.
Unique Approach	Owner/operator may offer unique approach to demonstrate equivalency.	Owner/operator may offer unique approach to demonstrate equivalency.		Owner/operator may offer unique approach to demonstrate equivalency.		Not applicable.
Manufacturers of Equipment	May apply for determination of equivalency for equipment, design, and operational requirements.	May apply for determination of equivalency for equipment, design, and operational requirements.		May apply for determination of equivalency for equipment, design, and operational requirements.		Not applicable.

<table>
<tr><th rowspan="2">Alternative Means of Emission Limitations: Batch Processes</th><th colspan="6">REGULATION</th></tr>
<tr><th>40 CFR part 60, subpart VV</th><th>40 CFR part 61, subpart J</th><th>40 CFR part 61, subpart V</th><th>40 CFR part 63, subpart H</th><th>40 CFR part 63, subpart I</th><th>40 CFR part 264, Subpart BB
40 CFR part 265, subpart BB</th></tr>
<tr><td>Monitoring Option</td><td>Not applicable.</td><td>Not applicable.</td><td>Not applicable.</td><td colspan="2">The batch processes provision is an alternative to complying with §§63.163 through 63.171 and §§63.173 through 63.176. Under the monitoring option for batch processes, the standards are similar to those for continuous processes with the monitoring frequency prorated to time in use of organic HAP.

Each time equipment is reconfigured for the production of a new product, the reconfigured equipment is to be monitored for leaks within 30 days of start-up. This initial monitoring of the reconfigured equipment can not be used in determining percent leaking equipment in the process unit.

Connectors are to be monitored in accordance with §63.174.

Equipment other than connectors are to be monitored based on the frequencies shown below, which can be adjusted to accommodate process operations:

BATCH PROCESS EQUIPMENT MONITORING FREQUENCIES
(other than connectors)
<table>
<tr><th rowspan="2">Batch Process Time in Use (% of year)</th><th colspan="3">Equivalent Continuous Process Monitoring Frequency</th></tr>
<tr><th>Monthly</th><th>Quarterly</th><th>Semiannually</th></tr>
<tr><td>0 to < 25%</td><td>quarterly</td><td>annually</td><td>annually</td></tr>
<tr><td>25 to < 50%</td><td>quarterly</td><td>semiannually</td><td>annually</td></tr>
<tr><td>50 to < 75%</td><td>bimonthly</td><td>three times a year</td><td>semiannually</td></tr>
<tr><td>75 to 100%</td><td>monthly</td><td>quarterly</td><td>semiannually</td></tr>
</table>
If a leak is detected, it must be repaired as soon as practicable, but no later than 15 calendars after detection. Delay of repair is allowed if equipment supplies have been depleted and supplies had been sufficiently stocked before their depletion and the repair is made no later than 10 calendar days after delivery of the replacement equipment.</td><td>Not applicable.</td></tr>
</table>

Alternative Means of Emission Limitations: Batch Processes	REGULATION					
	40 CFR part 60, subpart VV	40 CFR part 61, subpart J	40 CFR part 61, subpart V	40 CFR part 63, subpart H	40 CFR part 63, subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, subpart BB
Pressure Test Option	Not applicable.	Not applicable.	Not applicable.	Monitor for leaks when the equipment is in organic HAP service, in use with an acceptable surrogate volatile organic compound which is not an organic HAP, or is in use with any other detectable gas or vapor. Each time equipment is reconfigured for production of a different product or *intermediate, the batch process train* is to be pressure-tested for leaks before organic HAP is first fed into the equipment. Pressure test new or disturbed equipment when a batch process train is reconfigured. Pressure testing not required for routine seal breaks, such as changing hoses and filters. Batch process equipment test using either: • procedures specified for pressure or vacuum loss [see §63.180(f)] or • procedures specified for using a liquid [see §63.180(g)] Each batch process that operates in organic HAP service during a calendar year must be pressure tested at least once during that same calendar year. For pressure or vacuum tests, a leak is detected if the rate of pressure change in excess of 6.9 kilopascals (1 psig) in 1 hour; or if there is visible, audible, or olfactory evidence of fluid loss. For pressure tests using a liquid, a leak is detected if there are indications of dripping liquid or other evidence of fluid loss from process units. When leaks are detected, repairs must be made and a retest conducted before startup of the process. If the process unit fails this retest or the second of 2 consecutive pressure tests, the equipment must be repaired as soon as practicable but not later than 30 calendar days *after the second pressure test.*		Not applicable.

Alternative Means of *Emission* Limitations: Enclosed-Vented Process Units	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
	Not applicable.	Not applicable.		Process units enclosed such that all emissions from equipment leaks are vented through a closed-vent system to a control device are exempt from the requirements of §§63.163 through 63.171 and §§63.173 and 63.174. Enclosure is to be maintained under negative pressure at all times the process unit is in operation.		Not applicable.

Test Methods and Procedures	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Monitoring Method and Technique	*Method 21 of 40 CFR part 60, Appendix A* Test each piece of equipment unless demonstration is made that equipment is not *in VOC service*	*Method 21 of 40 CFR part 60, Appendix A* Instrument to meet performance criteria of Method 21 Traverse probe around all potential leak interfaces as close as possible as described in Method 21		Method 21 of 40 CFR part 60, Appendix A Instrument to meet performance criteria of Method 21 except: • response factor criteria is for the average composition of the process fluid, not each individual VOC in stream • for process streams that contain inerts that are not organic HAPs or VOC, average stream response factor is calculated on an inert-free basis If no instrument available that meet all Method 21 criteria, then instrument readings may be adjusted as specified. Monitor all equipment while it is "in service"		Method 21 of 40 CFR part 60, Appendix A Instrument to meet performance criteria of Method 21 Traverse probe around all potential leak interfaces as close as possible as described in Method 21
Calibration	Before use each day of use Procedures specified in Method 21 Calibration gases used: • zero air (less than 10 ppm hydrocarbon in air) • mixture of methane or n-hexane and air at about, but less than, 10,000 ppm methane or n-hexane	Before use each day of use Procedures specified in Method 21 Calibration gases used: • zero air (less than 10 ppm hydrocarbon in air) • mixture of methane or n-hexane and air at about, but less than, 10,000 ppm methane or n-hexane		Before use each day of use Procedures specified in Method 21 Calibration gases used: • zero air (less than 10 ppm of hydrocarbon in air) • Phase I: mixture of methane in air at concentration of about, but less than, 10,000 ppm • Phase II: mixture of methane in air at *concentration of about, but less than:* 10,000 ppm for agitators 5,000 ppm for pumps 500 ppm for all other equipment		Before use each day of use Procedures specified in Method 21 Calibration gases used: • zero air (less than 10 ppm hydrocarbon in air) • mixture of methane or n-hexane and air at about, but less than, 10,000 ppm methane or n-hexane

Test Methods and Procedures	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Calibration (concluded)				• Phase III: mixture of methane in air at concentration of about, but less than: 10,000 ppm for agitators 2,000 ppm for pumps in food/ medical service 5,000 ppm for pumps in polymerizing monomer service 1,000 ppm for all other pumps 500 ppm for all other equipment Phases II and III exception: under certain conditions may calibrate up to 2,000 ppm higher than the leak definition		
"No detectable emissions" monitoring	Background level determined by Method 21 Traverse probe as close to the potential leak interface as possible as described in Method 21 Calculate arithmetic difference between the maximum concentration indicated by the instrument and the background level compared to 500 ppm to determine compliance	Background level determined by Method 21 Traverse probe as close to the potential leak interface as possible as described in Method 21 Calculate arithmetic difference between the maximum concentration indicated by the instrument and the background level compared to 500 ppm to determine compliance		Background level determined by Method 21 Traverse probe as close to the potential leak interface as possible as described in Method 21 Calculate arithmetic difference between the maximum concentration indicated by the instrument and the background level compared to 500 ppm to determine compliance		Background level determined by Method 21 Traverse probe as close to the potential leak interface as possible as described in Method 21 Calculate arithmetic difference between the maximum concentration indicated by the instrument and the background level compared to 500 ppm to determine compliance

Test Methods and Procedures	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Not "in service" demonstration	Equipment must be demonstrated not to be in VOC service (i.e., VOC content never greater than 10% by weight). For demonstration: Use procedures that conform to ASTM E-260, E-168, E-169 to determine percent VOC in process fluid that is contained or contacts a piece of equipment. Engineering judgement may be used to estimate the VOC content if piece of equipment had not been shown previously to be in VOC service. Administrator will require use of ASTM Method D-2267b in event of disagreement to determine VOC content. Compounds determined by EPA to have negligible photochemical reactivity can be excluded in determining VOC content of a process fluid.	Equipment is presumed to be in VHAP service unless demonstrated that the VHAP content can never reasonably expected to exceed 10 percent by weight. For demonstration: Use procedures that conform to ASTM Method D-2267. Engineering judgment may be used to determine percent VHAP clearly does not exceed 10 percent. Administrator will require use of ASTM Method D-2267 in event of disagreement to determine VOC content. If owner or operator determines that a piece of equipment is in VHAP service, determination can only be revised by following demonstration procedures.		Equipment is presumed to be in organic HAP service unless demonstrated that the organic HAP content can never reasonably expected to exceed 5 percent by weight. For demonstration: Use Method 18 of 40 CFR part 60, appendix A to determine percent organic HAP. Engineering judgment may be used to determine percent organic HAP does not exceed 5 percent. Owner/operator may instead determine organic HAP content does not exceed 5 percent by weight.		Test each component to determine whether it contains or contacts a hazardous waste with organic concentration of 10 percent by weight or greater. For demonstration: Use ASTM Methods D 2267-88, E 169-87, E 168-88, E260-85, or Method 9060 or 8240 of SW-846. Engineering judgment may be used to estimate organic concentration. Regional Administrator will require the use of ASTM Methods D 2267-88, E 169-87, E 168-88, E260-85, or Method 9060 or 8240 of SW-846 in the event of disagreement to determine VOC content. If owner or operator determines that a piece of equipment contains or contacts a hazardous waste with an organic concentration of at least 10% be weight, the determination can only be revised by following the demonstration procedures..
Samples	Representative of process fluid that is contained in or contacts the equipment or the gas being combusted in flare.	Representative of process fluid that is contained in or contacts the equipment or the gas being combusted in flare.		Representative of process fluid that is contained in or contacts the equipment.		Representative of the highest total organic content hazardous waste that is contained in or contacts the equipment.
Vapor pressures	Standard reference texts or ASTM D-2879	Not specified				Standard reference texts or ASTM D-2879-86

Test Methods and Procedures	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Flare Compliance	Visible emissions: Method 22 Presence of flame: thermocouple or equivalent Exit velocity: Method 2, 2A, 2C, or 2D Component concentration: Method 18 and ASTM D 2504-67 Net Heat of Combustion: Published values or ASTM D 2382-76, if published values not available or cannot be calculated	Visible emissions: Method 22 Presence of flame: thermocouple or equivalent Exit velocity: Method 2, 2A, 2C, or 2D Concentration: Method 18 or ASTM D2509-67. Net Heat of Combustion: published value or ASTM D2382-76, if published values not available or cannot be calculated		Visible emissions: Method 22 Presence of flame: thermocouple or equivalent Exit velocity: Method 2, 2A, 2C, or 2D Concentration: Method 18 Net Heat of Combustion: published value or ASTM D2382-76, if published values not available or cannot be calculated		Visible emissions: Method 22 Presence of flame: heat sensing monitoring device with a continuous recorder that indicates the continuous ignition of the pilot flame Exit velocity: Method 2, 2A, 2C, or 2D Concentration: Method 18 Net Heat of Combustion: published value or ASTM D2382-76, if published values not available or cannot be calculated
Batch Processes - Pressure Test with Gas or Vacuum	Not applicable.	Not applicable.		Pressurize to operating pressure or place under vacuum Turn off once test pressure or vacuum is obtained Test for at least 15 minutes Calculate change in pressure Use pressure measurement device with accuracy of $\pm$2.5 millimeters of mercury Alternative equivalent procedures are allowed provided alternative is capable of detecting a pressure loss or rise.		Not applicable.

Test Methods and Procedures	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Batch Processes - Pressure Test with Liquid	Not applicable.	Not applicable.		Fill with test liquid until normal operating pressure is obtained. Test for at least 60 minutes, unless test fails before then. Inspect each seal for indications of fluid loss. If indications are found, a leak is detected. Alternative equivalent procedures are allowed provided alternative is capable of detecting fluid loss.		Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Consolidated *Recordkeeping*	An owner or operator of more than one *affected facility subject to this subpart* may use one recordkeeping system if the system identifies each record by facility.	An owner or operator of more than one process unit subject to this subpart may use one recordkeeping system if the system identifies each record by process unit.		An owner or operator of more than one process unit subject to this subpart may use one recordkeeping system if the system identifies each record by process unit and the program being implemented for each type of equipment.		An owner or operator of more than one hazardous waste management unit subject to this subpart may use one recordkeeping system if the system identifies each record by hazardous waste management unit.
When leak detected	Tagging Requirements • a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment • ID may be removed after it has been repaired, except for valves • for valves, ID may be removed after 2 months of monitoring with no leaks detected Log Requirements • instrument and operator *ID* numbers and equipment ID number • date leak detected (Continued on next page)	Tagging Requirements • a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment • ID may be removed after it has been repaired, except for valves • for valves, ID may be removed after 2 months of monitoring with no leaks detected Log Requirements • *instrument and operator ID numbers* and equipment ID number • date leak detected (Continued on next page)		Tagging Requirements • a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment • ID may be removed after it has been repaired, except for valves and connectors • for valves and connectors, ID may be removed after it has been monitored as specified and no leak has been detected during the follow-up monitoring Log Requirements • *instrument and equipment ID number*, and operator name, initials, and ID number • date leak detected (Continued on next page)		Tagging Requirements • a weather-proof and readily visible *identification, marked with the* equipment ID number, date evidence of potential leak found (heavy liquid service only), and date leak detected, attached to the leaking equipment • ID may be removed after it has been repaired, except for valves • for valves, ID may be removed after 2 months of monitoring with no leaks detected Log Requirements • *instrument* and operator ID numbers and equipment ID number • date evidence of potential leak found (only for equipment in heavy liquid service, pressure *relief devices in* light liquid service, and flanges and other connectors) • date leak detected (Continued on next page)

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
When leak detected (concluded)	• *dates of each attempt to repair leak* • repair methods applied in each attempt to repair • • "above 10,000" if maximum instrument reading after each repair attempt is $\geq$ *10,000 ppm* • "repair delayed" and reason for delay if leak is not repaired within 15 calendar days after detection • signature of owner/operator whose decision it was that repair could not be effected without a process shutdown • expected date of successful repair if leak is not repaired within the 15 days • dates of process unit shutdown that occurred while the equipment is unrepaired • date of successful repair of the leak Retain for 2 years in readily accessible location.	• dates of each attempt to repair leak • repair methods applied in each attempt to repair • "above 10,000" if maximum instrument reading after each repair attempt is $\geq$ 10,000 ppm • "repair delayed" and reason for delay if leak is not repaired within 15 calendar days after detection • signature of owner/operator whose decision it was that repair could not be effected without a process shutdown • expected date of successful repair if leak is not repaired within the 15 days • dates of process unit shutdown that occurred while the equipment is unrepaired • date of successful repair of the leak Retain for 2 years in readily accessible location.		• dates of first attempt to repair leak • • maximum instrument reading after successful repair or determined to be nonreparable • "repair delayed" and reason for delay if leak is not repaired within 15 calendar days after detection • documentation of sufficient supply of spare *parts on-site before depletion* and reason for depletion if repair delayed because stocked parts were depleted • ID of connectors open or otherwise had the seal broken since last monitoring period, and dates and results of follow-up monitoring • *dates and results of monitoring* • dates of process unit shutdown that occurred while the equipment is unrepaired • date of successful repair of the leak Retain for 2 years in a manner that can be readily accessed at the plant site.		• dates of each attempt to repair leak • repair methods applied in each attempt to repair • "above 10,000" if maximum instrument reading after each repair attempt is $\geq$ 10,000 ppm • "repair delayed" and reason for delay if leak is not repaired within 15 calendar days after detection • signature of owner/operator whose *decision it was that repair could not* be effected without a unit shutdown • expected date of successful repair if leak is not repaired within the 15 *days* • documentation supporting delay of repair of a valve • date of successful repair of the leak Log to be kept in the facility operating record for 3 years.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Closed vent systems and control devices	• detailed schematics, design specifications, and piping and instrumentation diagrams • dates and descriptions of any changes in design specifications • description of parameter(s) to be monitored to ensure proper operation and maintenance • explanation of selection of parameter(s) • periods when not operated according to design • dates of startups and shutdowns of control devices and closed-vent systems When no leak detected: - record that instrument of visual inspection was conducted - date of inspection - statement that no leaks were detected For unsafe and difficult to inspect parts of closed-vent system: - identification - explanation - plan for inspecting equipment Keep these records in a readily accessible location.	• detailed schematics, design specifications, and piping and instrumentation diagrams • dates and descriptions of any changes in *design specifications* • description of parameter(s) to be monitored to ensure proper operation and maintenance • explanation of selection of parameter(s) • periods when not operated according to design, including when flare pilot light is out • dates of startups and shutdowns of control devices and closed-vent systems Keep these records in a readily accessible location.		Design Specifications and Performance Demonstration: • detailed schematics, design specifications, and piping and *instrumentation diagrams* • dates and descriptions of any changes in design specifications • description of parameter(s) to be monitored to ensure proper operation and maintenance • flare design and compliance demonstration results • explanation of selection of parameter(s) The design specification and performance demonstration records are to be kept for the life of the equipment.	Description and date of each modification made to the closed-vent system or control device design. Identification of operating parameter, *description of monitoring* device, and diagram of monitoring sensor location(s) for the following types of monitoring devices: vent stream flow, temperature, heat sensing, organic concentration, regeneration cycles for carbon beds, and good combustion practices. Monitoring, operating, and inspection information required by paragraphs §§63.1033 (f) through (j). Date, time, and duration of each period that occurs while the control device is operating when any monitored parameter exceeds the value established in the control device design analysis. Explanation for each period for which monitored parameter exceeded the established value. For carbon adsorption systems, date when existing carbon in the control device is replaced with fresh carbon or, if monitoring the organic concentration to determine breakthrough, date and time of carbon breakthrough and date when existing carbon is replaced with fresh carbon.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Closed vent systems and control devices (concluded)				Records of Operation: • records of operation of closed-vent systems and control devices • dates and duration when closed-vent systems, and control devices not operated according to design • dates and duration when monitoring systems/devices are nonoperative • dates of startups and shutdowns • records of closed-vent inspections The records of operation are to be kept for 2 years.		Part 264: • For "other" control devices, the Regional Administrator will specify *the appropriate recordkeeping* requirements. Part 265: • For "other" control devices, monitoring and inspection information indicating proper operation and maintenance. Keep these records up-to-date in the facility operating record. Operating information is to be kept for 3 years.
Visual inspections	Not applicable.	Not applicable.		Documentation that inspection was conducted Dates of inspection These records are to be kept for 2 years.		Not applicable.
All equipment ...	List of ID numbers of subject equipment List of ID numbers of equipment designated for no detectable emissions *and signed by owner/operator* List of ID numbers for pressure relief devices in gas/vapor service For each compliance test for components designated for no detectable emissions: • dates conducted • background level measured • maximum instrument reading List of ID numbers of equipment in vacuum service	List of ID numbers of subject equipment (except welded fittings) List of ID numbers of equipment designated for no detectable emissions and signed by owner/operator List of ID numbers for pressure relief devices in gas/vapor service For each compliance test for components designated for no detectable emissions: • dates conducted • *background level measured* • maximum instrument reading List of ID numbers of equipment in vacuum service		List of ID numbers of subject equipment (except certain connectors) Location of equipment on site plan, log entries, etc. Connectors do not need to be individually identified if all connectors in a designated area or length of pipe are identified as a group and the number of connectors is identified Schedule by process unit for monitoring *connectors* and valves Identification of equipment in HAP service by tagging, identified on a plant *site plan, in log entries, or other* methods		List of ID numbers of subject equipment (except welded fittings) List of ID numbers of equipment designated for no detectable emissions and signed by owner/operator List of ID numbers for pressure relief devices in gas/vapor service For each compliance test for components designated for no detectable emissions: • dates conducted • background level measured • maximum instrument reading *List of* ID numbers of equipment in vacuum service

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
All equipment (continued)	Maintain records in a readily accessible location.	Maintain records for 2 years in a readily accessible location.		List of ID numbers for equipment equipped with a closed-vent system and control device. For each compliance test for components designated for no detectable emissions: • dates conducted and results • background level measured • maximum instrument reading. List of ID numbers of compressors and pressure relief devices complying with an instrument reading of less than 500 ppm above background standard. ID of surge control vessels or bottoms receivers equipped with a closed-vent system or control device. ID of pressure relief devices equipped with rupture disks. ID of instrumentation systems (individual components need not be identified). ID of screwed connectors complying with §63.174(c)(2). Identification can be by grouping or area. ID of connectors opened since last monitoring period. List of valves and connectors removed from or added to the process if net credits for the removal or the valves or connectors are expected to be used. Documentation of the integrity of the weld for removed connectors.	For open-ended valves or lines, list of ID numbers of subject valves and lines. ID numbers for equipment that contains or contacts hazardous waste with an organic concentration of at least 10% by weight for a period of fewer than 300 hours per year. Equipment identification number and hazardous waste management unit identification. Information to be kept for pumps equipped with a dual mechanical seal: • design criteria for indicating failure • explanation for selected criteria • any changes to the criteria and the reason for change. Approximate facility location on facility plot. Type of equipment. Percent-by-weight of total organics in hazardous waste at the equipment. Hazardous waste state at the equipment. Method of compliance. Retain in a log that is kept in the facility operating record.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
All equipment ... (concluded)				*Design criteria, explanation,* and changes to criteria of any pumps equipped with a dual mechanical seal. Copies of periodic reports (if database not capable of generating such). Maintain records in a manner that is readily accessible at the plant site.		
Unsafe to Monitor Equipment	*List of ID numbers* Planned schedule for monitoring	List of ID numbers Planned schedule for monitoring		List of ID numbers Planned schedule for monitoring		List of ID numbers Planned schedule for monitoring
Difficult to Monitor Equipment	List of ID numbers Explanation for designation Planned schedule for monitoring	List of ID numbers Explanation for designation Planned schedule for monitoring		List of ID numbers Explanation for designation *Planned schedule for monitoring*		List of ID numbers Explanation for designation Planned schedule for monitoring
Unsafe to Repair Connectors	Not applicable.	Not applicable.		List of ID numbers Explanation for designation		*Not applicable.*
Valves complying with alternative standard for skip-periods	*Schedule of monitoring* Percent valves leaking during each monitoring period	Schedule of monitoring Percent valves leaking during each *monitoring period*		Not applicable.		Schedule of monitoring Percent valves leaking during each monitoring period
Barrier fluid and seal systems	Design criteria for indicating failure Explanation for selected criteria Any changes to selected criteria and reasons for change	Design criteria for indicating failure Explanation for selected criteria Any changes to selected criteria and reasons for change		*Design criteria for indicating* failure Explanation for selected criteria Any changes to selected criteria and reasons for change		Design criteria for indicating failure Explanation for selected criteria Any changes to selected criteria and reasons for change

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Exemptions Determinations	Analysis demonstrating facility design capacity Statement listing feed or raw materials and products from facility and analysis demonstrating whether these chemicals are heavy liquids or beverage alcohols Analysis demonstrating that equipment is not in VOC service	Analysis demonstrating facility design capacity Analysis demonstrating that equipment is not in VHAP service		Information and data used to demonstrate that equipment is not in organic HAP service, is in HAP service fewer than 300 hours per year, or is in heavy liquid service		Analysis determining the design capacity of the unit Statement listing the hazardous waste influent to and effluent from each subject unit and an analysis determining whether these wastes are heavy liquids Up-to-date analysis and supporting information to determine whether or *equipment is subject to this subpart*. A new determination is required when the owner/operator takes any action that could result in an increase in the total organic content of the waste contained in or contacted by closed vent systems and control devices previously determined not subject to this rule
Not "In service"	Information and data used to *demonstrate that a piece of equipment is* not in VOC service	Information and data used to demonstrate that a piece of equipment is not in VHAP service		Information, data, and analysis used to demonstrate that a piece of equipment or process unit is in heavy liquid service		Not specified.
Batch Processes	*Not applicable.*	*Not applicable.*		<u>Monitoring of Batch Processes</u> List of equipment added since last monitoring period Record inspection performed if no leaks found Documentation of any switch from batch process monitoring to pressure testing or vice versa Identify equipment on a plant site plan, in log entries, or by other appropriate methods		Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Batch Processes (concluded)				<u>Pressure Test of Batch Processes</u> ID of each product, or product code, produced during calendar year Records demonstrating the proportion of the time during the calendar year the equipment is in use in a batch process that is subject to tho provisions of this subpart Date and results of monitoring for equipment added to the batch process unit since the last monitoring period Physical tagging not required; may be identified on plant site plan, in log entries, other appropriate methods Dates of each pressure test, the test pressure, and the pressure drop observed during the pressure test Records of any visible, audible, or olfactory evidence of fluid loss Failure of two consecutive pressure tests. Record the following and keep for two years: • date of each pressure test • date of each leak repair attempt • repair methods applied • reason for delay of repair • expected and actual delivery date of replacement equipment • date of successful repair		

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
No detectable emissions	Background level Maximum instrument reading	Background level Maximum instrument reading		Not applicable.		Background level Maximum instrument reading

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
QIP	Not applicable.	Not applicable.		If leak not repaired within 15 calendar days of discovery, reason for leak repair delay and expected date of successful repair Records of all analyses required under §§63.175(e) and §63.176(d), including: • list identifying areas associated with poorer than average performance and the associated service characteristics of the stream, the operating conditions, and maintenance practices • reasons for rejecting specific candidate superior emission performing valve or pump technology from performance trials • list of candidate superior emission performing valve or pump technologies and documentation of performance trial program items • beginning date and duration of performance trials of each candidate superior emission performing technology Records documenting the quality assurance program Records indicating all valves or pumps replaced or modified are in compliance with the quality assurance requirements Records documenting compliance with the 20 percent or greater annual replacement rate for pumps Information and data showing company has less than 100 employees		Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
QIP - Reasonable further progress	Not applicable.	Not applicable.		For each valve in each process unit subject to the QIP: • maximum instrument reading observed in each monitoring observation before repair, response factor for the stream (if appropriate), instrument model number, and date of the observation • whether the valve is in gas or light liquid service • if a leak is detected, the repair methods used and the instrument readings after repair If data analyzed as part of a larger analysis program; describe any maintenance or QIP intended to improve emission performance Percent leaking valves and rolling average percent reduction observed each quarter Beginning and end dates while meeting the requirements of the QIP	Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
QIP - Technology review and improvement	Not applicable.	Not applicable.		<u>For valves</u> Type and manufacturer, design, materials of construction, packing material, and year installed Service characteristics of the stream (e.g., operating pressure, temperature, fine diameter, corrosivity) Whether in gas/vapor or light liquid service If a leak is detected, the maximum instrument reading observed before a repair, response factor for stream if adjusted, instrument model number, and date of observation Repair methods used and the instrument readings after the repair Description of any maintenance or quality assurance program used in the process unit that are intended to improve performance Percent leaking valves observed each quarter Documentation of all inspections and recommendations for design or specification changes to reduce leak frequency Beginning and end dates while meeting requirements of the QIP		Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
QIP - Technology review and improvement (concluded)				<u>For pumps</u> Type and manufacturer, seal type and manufacturer, pump design, materials of construction, barrier fluid or packing material, and year installed Service characteristics of the stream, discharge pressure, temperature, flow rate, corrosivity, and annual operating hours Maximum instrument readings observed before repair, response factor for the stream, instrument number, and date of observation If a leak is detected, repair methods used and the instrument readings after the repair Rolling average percent leaking pumps Documentation of all inspections and recommendations for design or specification changes to reduce leak frequency Beginning and end dates while meeting requirements of the QIP	
Enclosed Vent Process	Not applicable.	Not applicable.		ID of process units and organic HAPs handled Schematic of process unit, enclosure, and closed-vent system Description of system used to create negative pressure		Not applicable.

Reporting Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Initial Report	Process unit identification Number of valves in gas/vapor and light liquid service, excluding those designated for no detectable emissions Number of pumps in light liquid service, excluding those designated for no detectable emissions or equipped with a compliant closed-vent system or control device Number of compressors, excluding those designated for no detectable emissions or equipped with a compliant closed-vent system and control device	For each source: • equipment identification number • process unit identification • type of equipment • percent weight VHAP • process fluid state • method of compliance Reporting schedule for submittal of subsequent semiannual reports An owner or operator is also required to submit a statement notifying the Administrator that the requirements of this subpart are being implemented. For existing sources and new sources with an initial startup date preceding the effective date, this notification is to be submitted within 90 days of the effective date. For new source with an initial startup date after the compliance date, this notification is to be submitted with the application for approval of construction.		<u>Initial Notification</u> • name and address of owner/operator • address of facility (physical location) • identification of subject processes • compliance statement • statement of whether a source can achieve compliance by the applicable compliance date <u>Notification of Compliance Status (for each subject process unit)</u> A. For each subject unit: • process unit identification • number of each equipment type (except those in vacuum service) • method of compliance • planned schedule for each phase (for light liquid pumps and gas/vapor valves) B. Batch processes: • batch products or product codes • planned schedule for testing C. Enclosed-vented process units: • process unit identification • description of negative pressure system and control device		Not specified.

Reporting Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Subsequent Semiannual/ Periodic Reports	Process unit identification The following information by month in the reporting period: • number of valves, pumps, and compressors for which leaks were detected • number of valves, pumps, and compressors for which leaks were not repaired as required • the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible Dates of process unit shutdowns that occurred within the semiannual reporting period Revisions to items reported in the initial semiannual report if changes have occurred since the initial semiannual report or subsequent revisions to the initial semiannual report Report of all performance tests in accordance with §60.8	Process unit identification The following information by month in the reporting period: • number of valves, pumps, and compressors for which leaks were detected • number of valves, pumps, and compressors for which leaks were not repaired as required • the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible Dates of process unit shutdowns that occurred within the semiannual reporting period Revisions to items reported in the initial semiannual report if changes have occurred since the initial semiannual report or subsequent revisions to the initial semiannual report		Submit the following information semi-annually starting 6 months after the Notification of Compliance: • the number of valves, pumps, compressors, agitators, connectors, and screwed connectors for which leaks were detected • the percent leakers for valves, pumps, connectors, and screwed connectors • the total number of valves, pumps, connectors, and screwed connectors monitored • the number of valves, pumps, compressors, agitators, connectors, and screwed connectors for which leaks were not repaired • identification of the number of valves and connectors determined to be nonreparable • explanation of why repairs delayed and why process unit shutdown was infeasible • notification of change in connector monitoring alternatives (if applicable) Revisions to items reported in the notification of compliance status if method of compliance has changed since the last report Information listed under Notification of Compliance Status for process units with later compliance dates For "no detectable emissions" components: all monitoring to show compliance		NOTE: The following is applicable to 40 CFR part 264, subpart BB only. The EPA identification number, name, and address of the facility. The following information by month in the reporting period: • equipment identification number of each valve, pump, and compressor for which leaks were not repaired as required • dates of hazardous waste management unit shutdowns that occurred within the Semiannual reporting period • dates when the required control device exceeded or operated outside design specifications and was not corrected within 24 hours, the duration and cause of each exceedance, and any corrective measures taken. If during the semiannual reporting period, pumps, valves, and connectors are repaired as required and the control device does not exceed or operate outside of design specifications for more than 24 hours, a report to the Regional Administrator is not required.

Reporting Requirements	REGULATION					
	40 CFR part 60, Subpart VV	40 CFR part 61, Subpart J	40 CFR part 61, Subpart V	40 CFR part 63, Subpart H	40 CFR part 63, Subpart I	40 CFR part 264, Subpart BB 40 CFR part 265, Subpart BB
Batch Processes - Pressure Testing	Not applicable.	Not applicable.		Batch product process equipment train *identification.* Number of pressure tests conducted. Number of failed pressure tests. Explanation of delay of repairs. All monitoring results.		Not applicable.
Other	Notification 90 days prior to election to comply with either alternative standard for valves in gas/vapor service. Report of all performance test in accordance with §60.8, except 30 day notification required only for initial performance test.	Notification 90 days prior to complying with either alternative standard for valves in gas/vapor service. Report of all performance test and . . . monitoring to determine compliance with no detectable emissions and with §63.243-1 and -2 conducted within the semiannual reporting period.		Not applicable.		Not applicable.

APPENDIX B

EQUIPMENT LEAK REGULATIONS: SUMMARY OF DIFFERENCES

SUMMARY OF REGULATION DIFFERENCES

General Aspects of Rule	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
APPLICABILITY	All equipment within a process unit in the synthetic organic manufacturing industry that commences construction, reconstruction, or modification after 1/5/81. A list of SOCMI chemicals produced as intermediates or final products by process units is provided to determine applicability.	Equipment that is operated in benzene service.	Equipment operated in volatile HAP (VHAP) service after the date for which part 61 regulations have been promulgated.	Equipment in organic HAP service operated at least 300 hours per year at facilities for which part 63 regulations have been adopted and that cross-reference this subpart. A list of organic HAP is provided to determine applicability.	Equipment in organic HAP service (see Definitions) operated at least 300 hours per year in the following types of processes: Styrene-butadiene rubber production; polybutadiene rubber production; processes producing five specific agricultural chemicals; processes producing six specific types of polymers/resins or other chemicals; pharmaceutical processes using carbon tetrachloride or methylene chloride; and five specified polymers/resins.[a] Specific HAPs are designated for determining applicability.	Equipment at facilities that treat, store, or dispose of hazardous wastes that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight that are managed in units subject to the permitting requirements of part 270 or hazardous waste recycling units located at such facilities otherwise subject to the permitting requirements of part 270.
EXEMPTIONS	Any affected facility with design capacity to produce less than 1,000 Mg per year. Any affected facility that has no equipment in VOC service. Any affected facility that produces heavy liquid chemicals only from heavy liquid feed or raw materials. Any affected facility that produces beverage alcohol.	Any equipment in benzene service located at plant designed to produce or use less than 1,000 Mg of benzene per year. Any process unit that has no equipment in benzene service. Coke by-product plants. Exempt from part 60 if subject to part 61.	None specified.	Research and development facilities. Exempt from part 60 and from part 61 if subject to part 63.	Research and development facilities. Facilities that do not have the designated HAP(s) need only document the basis for this determination. Exempt until no later than April 22, 1997, if plant site emits less than 10 tpy of any individual HAP and less than 25 tpy of any combination of HAP.	None specified.

SUMMARY OF REGULATION DIFFERENCES

General Aspects of Rule	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
DEFINITIONS						
"In gas/vapor service"	The piece of equipment contains process fluid that is in gaseous state at operating conditions.	A piece of equipment contains process fluid that is in the gaseous state at operating conditions.		A piece of equipment in organic hazardous air pollutant (HAP) service contains a gas or vapor at operating conditions.		The piece of equipment contains or contacts a hazardous waste stream that is in the gaseous state at operating conditions.
"In heavy liquid service"		Not applicable.				
"In light liquid service"		Not applicable.				
"In liquid service"	Not applicable.	A piece of equipment is not in gas/vapor service.		A piece of equipment in organic HAP service is not in gas/vapor service.		Not applicable.
"In VOC service"	The piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight.	The piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight and the piece of equipment is not in heavy liquid service (as defined under 40 CFR Part 60, subpart VV).		The piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight and the piece of equipment is not in heavy liquid service (as defined under 40 CFR Part 60, subpart VV).		Not applicable.
"In VHAP service"	Not applicable.	A piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight a volatile hazardous air pollutant (VHAP).		Not applicable.		Not applicable.
"In organic hazardous air pollutant or in organic (HAP) service"	Not applicable.	Not applicable.		A piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 5 percent by weight total organic HAP.	A piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 5 percent by weight of the designated organic HAP listed in §63.190(b) of this subpart.	Not applicable.
"In benzene service"	Not applicable.	A piece of equipment contains or contacts a fluid (liquid or gas) that is at least 10% benzene by weight.	Not applicable.	Not applicable.		Not applicable.
EQUIPMENT		ADDS: product accumulator vessels		ADDS: agitators, surge control vessels, bottoms receivers, and instrumentation systems.		

General Aspects of Rule	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
PROCESS UNIT	Components assembled to produce, as intermediate or final products, one or more of the chemicals specified in §60.489. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.	Equipment assembled to produce a VHAP or its derivatives as intermediate or final products, or equipment assembled to use a VHAP in the production of a product. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient product storage facilities.		A chemical manufacturing process unit as defined in subpart F of this part, a process unit subject to the provisions of subpart I of this part, or a process unit subject to another subpart in 40 CFR Part 63 that references this subpart.[b]		A contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area.[c]
REPAIRED	Equipment is adjusted, or otherwise altered, in order to eliminate a leak as indicated by one of the following: an instrument reading of 10,000 ppm or greater, indications of liquids dripping, or indication by sensor that a seal or barrier fluid has failed.	Equipment is adjusted, or otherwise altered, to eliminate a leak.		Equipment is adjusted, or otherwise altered, to eliminate a leak as defined in the applicable sections of this subpart.		Equipment is adjusted, or otherwise altered, to eliminate a leak.
EQUIPMENT IDENTIFICATION	None specified.	Mark subject equipment in such a manner as to readily distinguish from other pieces of equipment.		Same as 40 CFR Part 61, but adds: Identification does not require physical tagging.		Mark subject equipment in such a manner as to readily distinguish from other pieces of equipment.

[a] Processes producing styrene-butadiene rubber (butadiene and styrene emissions only). Processes producing polybutadiene rubber (butadiene emissions only). Processes producing the following agricultural chemicals (butadiene, carbon tetrachloride, methylene chloride, and ethylene dichloride emissions only): Captafol (R); Captan (R); Chlorothalonil; Dacthal; and Tordon (R) acid. Processes producing the following polymers/resins and other chemicals (carbon tetrachloride, methylene chloride, tetrachloroethylene, chloroform, and ethylene dichloride emissions only): Hypalon (R); Oxybisphenoxarsine/1,3-diisocyanate [OBPA (R)]; polycarbonates; polysulfide rubber; chlorinated paraffins; and symmetrical tetrachloropyridine. Pharmaceutical production processes using carbon tetrachloride or methylene chloride (carbon tetrachloride and methylene chloride emissions only). Processes producing the following polymers/resins and other chemicals (butadiene emissions only): tetrahydrophthalic anhydride (THPA); methlymethacrylate-butadiene styrene resins (MBS); butadiene-furfural cotrimer; methlymethacrylate-acrylonitrile-butadiene-styrene (MABS) resins; and ethylidene norbornene.

[b] "Chemical manufacturing process unit" means the equipment assembled and connected by pipes or ducts to process raw materials and to manufacture an intended product. For the purposes of this subpart, chemical manufacturing process unit includes air oxidation reactors and their associated product separators and recovery devices; reactors and their associated product separators and recovery devices; distillation units and their associated distillate receivers and recovery devices; associated unit operations (as defined in this section); and any feed, intermediate, and product storage vessels, product transfer racks, and connected ducts and piping. A chemical manufacturing process unit includes pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, instrumentation systems, and control devices or systems. A chemical process manufacturing unit is identified by its primary product.

[c] Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, *Subpart VV*	40 CFR Part 61, *Subpart J*	40 CFR Part 61, *Subpart V*	40 CFR Part 63, *Subpart H*	40 CFR Part 63, *Subpart I*	40 CFR Part 264, *Subpart BB* 40 CFR Part 265, Subpart BB
VALVES, GAS/VAPOR OR LIGHT LIQUID SERVICE						
Standards		Designates valves "in liquid service" not in either "light liquid" or "heavy liquid" service.				
Standards: Basic Monitoring Interval	Monthly that can go to quarterly.	Monthly that can go to quarterly.		Quarterly in Phases I and II. In Phase III, varies depending on percent leaking.		Monthly that can go to quarterly.
Standards: Plants with less than 250 valves in organic HAP service	Not applicable.	Not applicable.		In Phase III, can monitor quarterly (rather than monthly) or comply with paragraphs (d)(3) or (d)(4).		Not applicable.
No Detectable Emissions				Not applicable.		
Unsafe-to-Monitor: Interval				*ADDS:* but not more frequently than the periodic monitoring schedule otherwise applicable.		
Difficult-to-Monitor: Definition				ADDS: or it is not accessible at anytime in a safe manner		
Difficult-to-Monitor: Limit on Number	No more than 3.0 percent of valves in affected facility can be designated as difficult-to-monitor.	None specified.		No more than 3.0 percent of valves in affected facility can be designated as difficult-to-monitor.		None specified.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
VALVES, GAS/VAPOR OR LIGHT LIQUID SERVICE (concluded)						
Leak Definition	10,000 ppm	10,000 ppm		Phase I: 10,000 ppm Phase II: 500 ppm Phase III: 500 ppm		10,000 ppm
Repairs				ADDS: When repaired, monitor at least once within first 3 months after repair.		
Exemptions				Equipment operated less than 300 hours per year.		
VALVES, HEAVY LIQUID SERVICE						
Standards		Not applicable.				
Leak Definition	10,000 ppm	10,000 ppm		Monitoring: 500 ppm		10,000 ppm
Repair				For valves in heavy liquid service that are not monitored (Method 21), repair shall mean that visual, audible, olfactory, or other indications of a leak have been eliminated; no bubbles are observed at potential leak sites during leak check with soap solution; or system will hold a test pressure.		

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, *Subpart* BB 40 CFR Part 265, Subpart BB
ALTERNATIVE STANDARDS FOR VALVES						
Allowable Percentage of Valves Leaking						
Standard	Applies to "affected facilities"	Applies to "process units"		Not applicable.		Applies to "hazardous waste management *units*"
Notification	Not required.	Notification required if compliance with allowable percent is discontinued		Not required.		Notification required if compliance with allowable percent is discontinued
Skip Period Leak Detection and Repair						
Standard				Not applicable.		
Calculation	Calculate percent leaking by dividing sum of valves found leaking during current monitoring and valves for which repair has been delayed by the total number of subject valves.	Not specified.				Not specified.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
PUMPS, LIGHT LIQUID SERVICE						
Standards		ADDS: If located at unmanned plant site, visual inspections required at least monthly.		ADDS: If located at unmanned plant site, visual inspections required at least monthly. *ADDS:* Phase III: If the greater of either 10 percent of pumps in a process unit (or source-wide) or 3 pumps in a process unit (or source-wide) leak, then implement technology review and improvement QIP. (This does not apply to process unit if more than 90% of the pumps in the unit are either dual mechanical seal or designed with no externally activated shaft penetrating the housing.)		
DMS: Barrier Fluid Purges into Process	zero VOC emissions	zero VHAP emissions		no similar statement		no detectable emissions
DMS: Barrier Fluid System	in heavy liquid service and not in VOC service	not in VHAP service and not in VOC service		not in light liquid service		must not be a hazardous waste with organic concentrations 10 percent or greater by weight
DMS: Indications of Liquids Dripping	Indications means a leak is detected.	Indications require monitoring with instrument. A leak is detected if: (1) the presence of VHAP is detected, or (2) an instrument reading is 10,000 ppm or greater (total VOC) is measured.		*Indications require monitoring with* instrument. A leak is detected if instrument reading is 1,000 ppm or greater.		Indications means a leak is detected.
DMS: Sensor and Audible Alarm				Daily observation or equipped with alarm waived if located at an unmanned plant site.		Check alarm monthly to ensure it is functioning properly.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
PUMPS, LIGHT LIQUID SERVICE (concluded)						
No Detectable Emissions				Not provided. Instead provides basic exemption for pumps designed with no externally actuated shaft penetrating the pump housing (a specification under the other standards for pumps designated for no detectable emissions).		
Leak Definition	10,000 ppm	10,000 ppm		Phase I: 10,000 ppm Phase II: 5,000 ppm Phase III: 5,000 ppm (polymerizing monomers) 2,000 ppm (food/medical services) 1,000 ppm (all other pumps)		10,000 ppm
Repair				For pumps in Phase III subject to the leak definition of 1,000 ppm, repair is not required unless instrument reading of 2,000 ppm or greater is detected.		
First Attempt *at Repair*	None specified.	None specified.		Best practices include, but are not limited to: - tightening of packing gland nuts - ensuring that the seal flush is operating at design pressure and *temperature*		None specified.
Exemptions				ADDS: Use compliant closed-vent system that transports leakage back to the process or to a compliant control device. Equipment operated less than 300 hours per year.		

Specific Component *Summaries*	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, *Subpart J*	40 CFR Part 61, Subpart V	40 CFR Part 63, *Subpart H*	40 CFR Part 63, *Subpart I*	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
PUMPS, HEAVY LIQUID SERVICE						
Standards		*Not applicable.*				
Leak Definition	10,000 ppm			Monitoring: 2,000 ppm		10,000 ppm
Repair				For pumps in heavy liquid service that are not monitored (Method 21), repair shall mean that *visual, audible, olfactory,* or other indications of a leak have been eliminated; no bubbles are observed at *potential* leak sites during leak check with soap solution; or system will hold a test pressure.		
Exemptions				Equipment operated less than 300 hours per year.		

SUMMARY OF REGULATION DIFFERENCES

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
PRESSURE RELIEF DEVICES, GAS/VAPOR SERVICE						
Standards				*ADDS:* With Rupture Disk After each release, replace rupture disk within 5 calendar days.		
Repair				Not applicable.		
Exemptions				Equipment operated less than 300 hours per year.		
PRESSURE RELIEF DEVICES, LIGHT LIQUID OR HEAVY LIQUID SERVICE						
Standards						
Leak Definition	10,000 ppm	10,000 ppm		Monitoring: 500 ppm		10,000 ppm
Repair				For pressure relief devices in liquid service that are not monitored (Method 21), repair shall mean that visual, audible, olfactory, or other indications of a leak have been *eliminated; no bubbles are observed at* potential leak sites during leak check with soap solution; or system will hold a test pressure.		
Exemptions				Equipment operated less than 300 hours per year.		

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
COMPRESSORS						
Standards						
Standards: Barrier Fluid Purges into Process	zero VOC emissions	zero VHAP emissions		no similar statement		*no detectable emissions*
Standards: Barrier Fluid Systems	in heavy liquid service and not in VOC service	not in VHAP service and not in VOC service		not in light liquid service		must not be a hazardous waste with organic concentrations 10 percent or greater by weight
Standards: Sensor and Audible Alarm				Daily observation or equipped with alarm waived if located at an unmanned plant site.		Check alarm monthly to ensure it is functioning properly.
Exemptions	Reciprocating compressors that meet certain criteria.			Equipment operated less than 300 hours per year.		

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
SAMPLING CONNECTION SYSTEMS						
Standards: Introduction				ADDS: The system shall collect or capture the *sample purge for return to* the process. Gases displaced during filling of the sample container are not required to be collected or *captured*.		
Standards: Return of – fluid to process or recycle	ADDS: Closed-loop system with zero VOC emissions to the atmosphere		with zero VHAP emissions to the atmosphere	ADDS: Closed-loop system No mention of emissions to the atmosphere.		With no detectable emissions to the atmosphere
Exemptions	ADDS: Sampling systems without purges.			ADDS: Sampling systems without purges. Equipment operated less than 300 hours per year.		
OPEN-ENDED VALVES OR LINES						
Standards				ADDS: flow allowed during maintenance or repair.		
Exemptions				ADDS: Open-ended valves and lines in an emergency shutdown system that are designed to open automatically in the event of a process upset. Equipment operated less than 300 hours per year.		

Specific Component *Summaries*	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
FLANGES AND OTHER CONNECTORS (ALL SERVICES)						
Standards				*Not applicable. The subpart has standards for connector in gas/vapor or light liquid service and for connectors in heavy liquid service.*		
CONNECTORS, GAS/VAPOR OR LIGHT LIQUID SERVICE						
Standards	Not applicable [See Flanges and other connectors (all services)].	Not applicable [See Flanges and other connectors (all services)].		See Regulatory Summary table for description of regulations for these components.		Not applicable [See Flanges and other *connectors (all services)*].
CONNECTORS, HEAVY LIQUID SERVICE						
Standards	Not applicable [See Flanges and other connectors (all services)].	Not applicable.		See Regulatory Summary table for description of regulations for these components.		Not applicable [See Flanges and other connectors (all services)].
AGITATORS, GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE						
Standards	Not applicable.	Not applicable.		See Regulatory Summary table for description of regulations for these components.		Not applicable.
AGITATORS, HEAVY LIQUID SERVICE						
Standards	Not applicable.	Not applicable.		See Regulatory Summary table for description of regulations for these components.		Not applicable.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
INSTRUMENTATION SYSTEMS						
Standards	Not applicable.	Not applicable.		See Regulatory Summary table for description of regulations for these components.		Not applicable.
PRODUCT ACCUMULATOR VESSELS						
Standards	Not applicable.	See Regulatory Summary table for description of regulations for these components.		Not applicable (see Surge Control Vessels and Bottoms Receivers)		Not applicable.
SURGE CONTROL VESSELS AND BOTTOMS RECEIVERS						
Standards	Not applicable.	Not applicable (see Product Accumulator Vessels)		See Regulatory Summary table for description of regulations for these components.		Not applicable.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB *40 CFR Part 265*, Subpart BB
CLOSED VENT SYSTEMS AND CONTROL DEVICES						
Standards: Vapor Recovery Devices						Vapor recovery systems: 95 percent or greater recovery unless total organic emission limits of §265.1032(a)(1) for all affected processes can be attained at an efficiency of less than 95 percent. For carbon adsorbers, carbon replacement intervals specified.
Standards: Combustion Devices	minimum residence time of 0.75 seconds and minimum temperature of 816°C	minimum residence time of 0.50 seconds and minimum temperature of 760°C		minimum residence time of 0.50 seconds and minimum temperature of 760°C		minimum residence time of 0.50 seconds and minimum temperature of 760°C or to 20 ppmv
Standards: Flares	Comply with §60.18	Comply with §60.18		Comply with §63.11(b)		Basic requirements for visible emissions, heat content, and exit velocities.
Standards: Closed-Vent Systems	Initial and annual inspection requirements, which vary based on whether hard piping or ductwork is used.	No detectable emissions and no visual indications.		Initial and annual inspection requirements, which vary based on whether hard piping or ductwork is used.		No detectable emissions.
Monitoring: Control Devices						Specific requirements identified for vent stream flow monitors and other monitors for specific types of control devices.
Monitoring: Closed-Vent Systems	Install flow monitors or monthly visual inspections where bypass lines could divert flow	Initially, annually, and at other times specified by EPA		Install flow monitors or monthly visual inspections where bypass lines could divert flow		Initially, annually, and at other times specified by EPA
Inspections: Closed-Vent Systems	If contains by-pass lines, (1) vent stream flow meters or (2) car-seal or lock-and-key type of configuration with monthly visual inspection required. "Unsafe-to-monitor" parts: inspect as frequently as practicable, but no more frequently than annually. "Difficult-to-monitor" parts: inspect at least once every 5 years.	None specified.		If contains by-pass lines, (1) vent stream flow meters or (2) car-seal or lock-and-key type of configuration with monthly visual inspection required. "Unsafe-to-monitor" parts: inspect as frequently as practicable, but no more frequently than annually. "Difficult-to-monitor" parts: inspect at least once every 5 years.		None specified.

Specific Component Summaries	REGULATION					
	40 CFR Part 60, *Subpart VV*	40 CFR Part 61, *Subpart J*	40 CFR Part 61, *Subpart V*	40 CFR Part 63, *Subpart H*	40 CFR Part 63, *Subpart I*	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
CLOSED VENT SYSTEMS AND CONTROL DEVICES (concluded)						
Leak Definition	500 ppm.	Not applicable.		500 ppm		Not applicable. CVS: detectable emissions $\geq$500 above background
Repair	ADDS: Delay of repair allowed under certain circumstances. Repair required no later than by end of next process unit shutdown.			ADDS: Delay of repair allowed under certain circumstances. Repair required no later than by end of next process unit shutdown.		
Exemptions				Equipment operated less than 300 hours per year. Equipment needed for safety purposes are not subject to these monitoring requirements.		

Delay of Repair	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, *Subpart BB*
General: Isolated Equipment	*Does not remain in VOC service.*	*Does not remain in VHAP service.*		Does not remain in organic HAP service.		Does not continue to contain or contact hazardous waste with organic concentrations of at least 10 percent by weight.
Valves	Not allowed unless next process unit shutdown occurs sooner than 6 months after 1st process unit shutdown.	Not allowed unless next process unit shutdown occurs sooner than 6 months after 1st process unit shutdown.		*Not allowed beyond the second process unit* shutdown unless the third process unit shutdown occurs sooner than 6 months after 1st process unit shutdown.		Not allowed unless next unit shutdown occur sooner than 6 months after 1st unit shutdown.
Connectors and Agitators	Not applicable.	Not applicable.		Allowed if: *emissions from purged material resulting* from immediate repair less than from the delay purged material is later collected and destroyed or recovered in compliant control device Delay beyond next process unit shutdown allowed if otherwise sufficient supply of valves have been depleted.		Not applicable.
Pumps				Additional allowances: If repair requires replacing existing seal design with a new system that provides better performance or compliant closed-vent system and control device.		

Quality Improvement Programs	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Applicability	Not applicable.	Not applicable.		See Regulatory Summary table for description of Quality Improvement Programs.		Not applicable.

Equivalence of (or Alternative) Means of Emission Limitation	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB *40 CFR Part 265*, Subpart BB
Equipment, Design, *and Operational* Requirements		No requirement for Administrator to *compare test data.*				Not applicable.
Work Practices: Demonstration of Emission Reduction for Required Work Practice	No length of demonstration period indicated.	Required for minimum of 12 months.		Required for minimum of 12 months.		Not applicable.
Unique Approach						Not applicable.
Manufacturers of Equipment						Not applicable.

Alternative Means of Emission Limitation: Batch Processes	REGULATION					
	40 CFR Part 60, subpart VV	40 CFR Part 61, subpart J	40 CFR Part 61, subpart V	40 CFR Part 63, subpart H	40 CFR Part 63, subpart I	40 CFR Part 265, subpart BB
	Not applicable.	Not applicable.		See Regulatory Summary table for description of standards for batch processes.		Not applicable.

Alternative Means of Emission Limitation: Enclosed-Vented Process Units	REGULATION					
	40 CFR Part 60, *Subpart VV*	40 CFR Part 61, *Subpart J*	40 CFR Part 61, *Subpart V*	40 CFR Part 63, *Subpart H*	40 CFR Part 63, *Subpart I*	40 CFR Part 264, *Subpart BB* 40 CFR Part 265, Subpart BB
	Not applicable.	Not applicable.		See Regulatory Summary table for description of standards for enclosed-vented process units.		Not applicable.

Test Methods and Procedures	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart *J*	40 CFR Part 61, Subpart V	40 CFR Part 63, *Subpart H*	40 CFR Part 63, *Subpart I*	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Monitoring Method, Technique, and Instrument	ADDS: Test each piece of equipment unless demonstration is made that equipment is not in VOC service.	*ADDS: Instrument to meet performance* criteria of Method 21 Traverse probe around all potential leak interfaces as close as possible as described in Method 21		ADDS: Instrument to meet performance criteria of Method 21 except: response factor criteria is for the average composition of the process fluid, not each individual VOC in stream for process streams that contain inerts that are not organic HAPs or VOC, average stream response factor is calculated on an inert-free basis If no instrument available that meet all *Method 21 criteria, then instrument* readings may be adjusted as specified Monitor all equipment while it is "in service"		ADDS: Instrument to meet performance criteria of Method 21 Traverse probe around all potential leak interfaces as close as possible as described in Method 21
Calibration				gases: limits to methane Phase II: mixture of methane in air at *concentration of about, but less than:* 10,000 ppm for agitators 5,000 ppm for pumps 500 *ppm* all other equipment Phase III: mixture of methane in air at concentration of about, but less than: 10,000 ppm for agitators 2,000 ppm for pumps in food/ medical service 5,000 ppm for pumps in polymerizing monomer service 1,000 ppm for all other pumps 500 ppm for all other equipment *Phase II and III Exception: under certain* conditions may calibrate up to 2,000 ppm higher than the leak definition		

Test Methods and Procedures	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Not "in service" determination	For demonstration: Use procedures that conform to ASTM E-260, E-168, E-169 to determine percent VOC in process fluid that is contained or contacts a piece of equipment. Engineering judgement may be used to estimate the VOC content if piece of equipment had not been shown previously to be in VOC service. Administrator will require use of ASTM Method D-2267b in event of disagreement to determine VOC content. Compounds determined by EPA to have negligible photochemical reactivity can be excluded in determining VOC content of a process fluid.	For demonstration: Use procedures that conform to ASTM Method D-2267. Engineering judgment may be used to determine percent VHAP clearly does not exceed 10 percent. Administrator will require use of ASTM Method D-2267b in event of disagreement to determine VOC content.		For demonstration: Use Method 18 of 40 CFR Part 60, appendix A to determine percent organic HAP. Engineering judgment may be used to determine percent organic HAP does not exceed 5 percent. Owner/operator may instead determine organic HAP content does not exceed 5 percent by weight.		For demonstration: Use ASTM Methods D 2267-88, E 169-87, E 168-88, E260-85, or Method 9060 or 8240 of SW-846. Engineering judgment may be used to estimate organic concentration. Regional Administrator will require the use of ASTM Methods D 2267-88, E 169-87, E 168-88, E260-85, or Method 9060 or 8240 of SW-846 in the event of disagreement to determine VOC content.
Revisions of "In service" determination	None specified.	Determination of in VHAP service can be revised only by following specified procedures.		Determination of in organic HAP service can be revised by either following specified procedures or documenting a change in process or raw materials no longer causes equipment to be in organic HAP service.		If owner or operator determines that a piece of equipment contains or contacts a hazardous waste with an organic concentration of at least 10% be weight, the *determination can only be revised by* following the demonstration procedures.
Samples	Representative of process fluid that is contained in or contacts the equipment or the gas being combusted in flare.	Representative of process fluid that is contained in or contacts the equipment or the gas being combusted in flare.		Representative of process fluid that is contained in or contacts the equipment.		Representative of the highest total organic content hazardous waste that is contained in or contacts the equipment.
Vapor pressures	Standard reference texts or ASTM D-2879	Not specified.		Not specified.		Standard reference texts or ASTM D-2879-86
Flare Compliance	Presence of flame: thermocouple or *equivalent.* Component concentration: Method 18 and ASTM D-2504-67	Presence of flame: thermocouple or equivalent Concentration: Method 18 or ASTM D2509-67.		Presence of flame: thermocouple or equivalent. Concentration: Method 18		Presence of flame: heat sensing monitoring device with a continuous recorder that indicates the continuous ignition of the pilot flame. Concentration: Method 18

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Batch Processes - Pressure Test with Gas or Vacuum	Not applicable.	Not applicable.		See Regulation Summary table for specific requirements.		Not applicable.
Batch Processes - Pressure Test with Liquid	Not applicable.	Not applicable.		See Regulation Summary table for specific requirements.		Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
When leak detected ...	DOES NOT HAVE: dates of process unit shutdown that occurred while the equipment is unrepaired			id removal after repair except for valves and connectors and no leak detected during followup monitoring for valves and connectors, id may be removed after 2 months of no leaks detected and no leak has been detected during the followup monitoring ADDS: operator name and initials maximum instrument reading after successful repair or determined to be nonrepairable for connectors: id of connectors disturbed since last monitoring period, and dates and results of follow-up monitoring copies of periodic reports (if database not capable of generating such) DOES NOT HAVE: repair methods applied in each attempt to repair "above 10,000" if maximum instrument reading after each repair attempt is $\geq$ 10,000 ppm signature of owner/operator whose decision it was that repair could not be effected without a process shutdown		for a weather-proof and readily visible identification, adds: date evidence of potential leak found and date leak detected ADDS: date evidence of potential leak found documentation supporting delay of repair of a valve DOES NOT HAVE: dates of process unit shutdown that occurred while the equipment is unrepaired

Recordkeeping Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Closed vent systems and control devices				ADDS: flare design and compliance demonstration results records of operation of closed-vent systems and control devices dates and duration when closed-vent systems, and control devices not operated according to design dates and duration when monitoring systems/devices are nonoperative records of closed-vent inspections		ADDS: explanation of each period of exceedances For carbon adsorbers: date when fresh carbon added monitoring of carbon breakthrough (certain carbon adsorbers) For other, non-specified control devices, monitoring and inspection information indicating proper operation and maintenance
Visual inspections	Not applicable.	Not applicable.		documentation that inspection was conducted dates of inspection		Not applicable.

Recordkeeping Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, *Subpart BB* 40 CFR Part 265, Subpart BB
All equipment ...	list of id numbers of subject equipment	list of id numbers of subject equipment (except welded fittings)		list of id numbers of subject equipment (except certain connectors) ADDS: schedule for monitoring connectors list of id numbers for equipment equipped with closed-vent system and control device list of id numbers of compressors and pressure relief devices complying with less than 500 ppm above background standard list of id numbers of pressure relief devices with rupture disks id of instrumentation systems *id of screwed connectors* complying with §63.174(c)(2) list of valves and connectors removed if net credits for their removal are expected to be used DOES NOT HAVE: list of id numbers of equipment designated for no detectable emissions and signed by owner/operator list of id numbers for pressure relief devices in *gas/vapor service* for each compliance test for components designated for no detectable emissions date conducted background level measured maximum instrument reading list of id numbers of equipment in vacuum service		list of id numbers of subject equipment (except welded fittings) ADDS: equipment identification number and hazardous waste management unit identification approximate facility location type of equipment percent-by-weight of total organics in hazardous waste at the equipment hazardous waste state at the equipment method of compliance

Recordkeeping Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, *Subpart H*	40 CFR Part 63, *Subpart I*	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Unsafe or Difficult to Monitor Valves						
Unsafe-to- Monitor or Repair, *Inaccessible or* Glass-Lined Connectors	Not applicable.	Not applicable.		list of id numbers explanation for designation plan or schedule for monitoring		Not applicable.
Valves complying with alternative standard for skip-periods				*Not applicable.*		
Exemption *Determinations*	analysis demonstrating facility design *capacity* statement listing feed or raw materials and products from facility and analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol analysis demonstrating that equipment is not in VOC service	analysis demonstrating facility design capacity analysis demonstrating that equipment is not in VHAP service		identification of equipment in organic HAP service less than 300 hours per year		an analysis determining the design capacity of the unit statement listing the hazardous waste influent to and effluent from each subject unit *and an analysis determining whether these* wastes are heavy liquids *an up-to-date analysis and supporting* information to determine whether or equipment is subject to this subpart
Not "In service"	information and data used to demonstrate that a piece of equipment *is not in* VOC service	information and data used to demonstrate that a piece of equipment is not in VHAP service		information, data, and analysis used to demonstrate that a piece of equipment or process unit is in heavy liquid service		Not specified.
Batch Processes	Not applicable	Not applicable		See Regulation Summary table for specific requirements.		Not applicable
QIP	Not applicable.	Not applicable.		See Regulation Summary table for specific requirements.		Not applicable.
Enclosed Vent Process	Not applicable.	Not applicable.		See Regulation Summary table for specific requirements.		Not applicable.

Reporting Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Initial Report	process unit identification number of valves, pumps, and compressors, excluding those designated for no detectable emissions	For each source: *equipment identification number* process unit identification type of equipment percent weight VHAP process fluid state method of compliance Reporting schedule for submittal of subsequent semiannual reports *An owner or operator is also required to* submit a statement notifying the Administrator that the requirements of this subpart are being implemented. For existing sources and new sources with an initial startup date preceding the effective date, this notification is to be submitted within 90 days of the effective date. For new source with an initial startup date after the compliance date, this notification is to be submitted with the application for approval of construction.		Initial Notification *name and address of owner/operator* address of facility (physical location) identification of subject processes compliance statement statement of whether a source can achieve compliance by the applicable compliance date Notification of Compliance Status (for each subject process unit) A. For each subject unit: *process unit identification* number of each equipment type (except those in vacuum service) method of compliance planned schedule for each phase B. Batch processes: batch products or product codes planned schedule for testing C. *Enclosed-vented Process Units* process unit identification description of negative pressure system and control device		Not specified.

Reporting Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB
Subsequent SemiAnnual/ Period Reports	process unit identification The following information by month in the reporting period: number of valves, pumps, and compressors for which leaks were detected number of valves, pumps, and compressors for which leaks were not repaired as required the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible	process unit identification The following information by month in the reporting period: number of valves, pumps, and compressors for which leaks were detected number of valves, pumps, and compressors for which leaks were not repaired as required the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible		not required not required by month the number of valves, pumps, compressors, agitators, connectors, and screwed connectors for which leaks were detected the number of valves, pumps, compressors, agitators, connectors, and screwed connectors for which leaks were not repaired explanation of why repairs delayed and why process unit shutdown was infeasible ADDS: the percent leakers for valves, pumps, connectors, and screwed connectors the total number of valves, pumps, connectors, and screwed connectors monitored identification of the number of valves and connectors determined to be nonrepairable notification of change in connector monitoring alternatives (if applicable) For "no detectable emissions" components: all monitoring to show compliance initiation of monthly monitoring under phase III or QIP (if applicable)		Not specified for part 265. For part 264: The EPA identification number, name, and address of the facility. The following information by month in the reporting period: equipment identification number of each valve, pump, and compressor for which leaks were not repaired as required dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period dates when the required control device exceeded or operated outside design specifications and was not corrected within 24 hours, the duration and cause of each exceedance, and any corrective measures taken. If during the semiannual reporting period, pumps, valves, and connectors are repaired as required and the control device does not exceed or operate outside of design specifications for more than 24 hours, a report to the Regional Administrator is not required.

Reporting Requirements	REGULATION					
	40 CFR Part 60, Subpart VV	40 CFR Part 61, Subpart J	40 CFR Part 61, Subpart V	40 CFR Part 63, Subpart H	40 CFR Part 63, Subpart I	40 CFR Part 264, Subpart BB *40 CFR Part 265,* Subpart BB
Subsequent SemiAnnual/ Period Reports (concluded)	Dates of process unit shutdowns that *occurred within the semiannual* reporting period	Dates of process unit shutdowns that *occurred within the semiannual reporting* period		not required		not required
	Revisions to items reported in the initial semiannual report if changes have occurred since the initial semiannual report or subsequent revisions to the initial semiannual report	Revisions to items reported in the initial semiannual report if changes have occurred since the initial semiannual report or subsequent revisions to the initial semiannual report		not required		not required
	Report of all performance test in accordance with §60.8.	Report of all performance test and monitoring to determine compliance with no detectable emissions and with §63.243-1 and -2.		not required		not required
Batch Processes - Pressure Testing	Not applicable.	Not applicable.		See Regulation Summary table for specific requirements.		Not applicable.
Compliance with Alternative Standards for Valves	90 day prior notice required.	90 day prior notice required.		Not applicable.		Not applicable.