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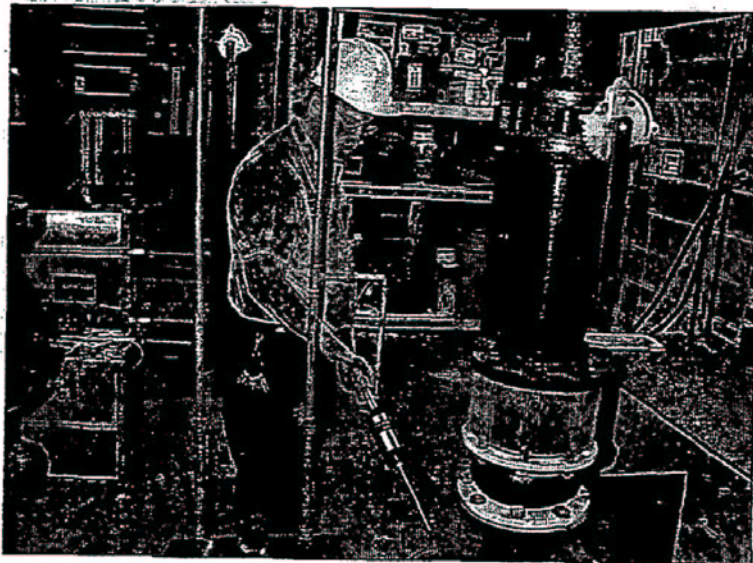
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# **Inspection Manual: Federal Equipment Leak Regulations for the Chemical Manufacturing Industry**

## **Volume II: Chemical Manufacturing Industry Regulations**



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

**Appendix C**

## APPENDIX C

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## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Control devices and closed-vent systems to be operated at all times that emissions may be vented to them</p> <p>Control Devices:</p> <ul style="list-style-type: none"> <li>• vapor recovery systems: 95 percent or greater recovery</li> <li>• combustion devices: 95 percent or greater reduction or minimum residence time of 0.75 seconds at a minimum temperature of 816 °C</li> <li>• flares: comply with §60.18</li> <li>• monitor to ensure operated and maintained in conformance with design</li> </ul> <p>Monitoring:</p> <ul style="list-style-type: none"> <li>• closed-vent systems: inspect initially, annually, and at other times as requested by the Administrator</li> </ul>
Leak Definition	> 500 ppm above background or visual inspections
Alternative Standards	Equivalent means of emission limitation
Exemptions	<p>Vapor collection or closed-vent systems operated under a vacuum</p> <p>Unsafe or difficult to inspect portions of closed-vent systems require alternate inspection plan</p>
Monitoring Method	<p>Hard pipe construction: Method 21 for initial inspection, annual visual inspections</p> <p>Duct work construction: Method 21 for initial and annual inspections</p>
Repair Requirements	<p>First attempt to repair within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown or if owner/operator determines that emissions from immediate repair would be greater than emissions from delay of repair. Repair is required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VOC service</p>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When no leak detected:</p> <ul style="list-style-type: none"> <li>• record that instrument or visual inspection was conducted</li> <li>• date of inspection</li> <li>• statement that no leaks were detected</li> </ul> <p>Information to be kept for all closed-vent systems and control devices:</p> <ul style="list-style-type: none"> <li>• <i>detailed schematics, design specifications, and piping and instrumentation diagrams</i></li> <li>• dates and descriptions of any changes in design specifications</li> <li>• <i>description of parameter(s) to be monitored to ensure proper operation and maintenance</i></li> <li>• explanation of selected parameter(s)</li> <li>• periods when not operated according to design</li> <li>• dates of startups and shutdown of closed-vent system and control device</li> <li>• list of ID numbers of subject closed-vent systems and control devices</li> <li>• list of ID numbers for closed-vent systems and control devices in vacuum service</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul> <p>Information to be kept for unsafe to inspect parts of closed-vent system (40 CFR 60.482-10(j)):</p> <ul style="list-style-type: none"> <li>• identification</li> <li>• explanation for designation</li> <li>• plan for inspecting equipment</li> </ul> <p>Information to be kept for difficult to inspect parts of closed-vent system (40 CFR 60.482-10(k)):</p> <ul style="list-style-type: none"> <li>• identification</li> <li>• explanation for designation</li> <li>• plan for inspecting equipment</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• <i>dates of process unit shutdowns that occurred within the semiannual reporting period</i></li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8</li> </ul>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Equipped with compliant seal system that includes a barrier fluid system that prevents leakage of VOC to atmosphere</p> <p>For each seal system:</p> <ul style="list-style-type: none"> <li>• operate with the barrier fluid at a pressure that is greater than the stuffing box pressure, or</li> <li>• equip with a barrier fluid system that is connected by a closed vent system to a compliant control device, or</li> <li>• equip with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere</li> </ul> <p><i>The barrier fluid system shall be in heavy liquid service or shall not be in VOC service</i></p> <p>Install sensor to detect failure of seal system, barrier fluid system, or both</p> <p>Check sensor daily or equip with audible alarm</p> <p>Establish criteria that indicates failure of seal system, barrier fluid system, or both</p>
Leak Definition	Sensor indicates failure of seal system, barrier fluid system, or both, based on established criteria.
Alternative Standards	Equivalent means of emission limitation
Exemptions	<p>Equipment in vacuum service</p> <p>Reciprocating compressors that meet certain criteria</p> <p>Compressors designated for no detectable emissions, which operate less than 500 ppm above background (see No Detectable Emissions)</p> <p><i>Compressors equipped with a compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)</i></p>
Monitoring Method	Sensor alarm or visual check
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 calendar days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VOC service</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p><b>When leak detected:</b></p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p><b>Information to be kept in log for 2 years after leak detected:</b></p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p><b>Information to be kept for all compressors:</b></p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject compressors</li> <li>• list of ID numbers of compressors designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for compressors designated for no detectable emissions:               <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for compressors in vacuum service</li> </ul> <p><b>Information to be kept for barrier fluid and seal systems:</b></p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to selected criteria and reasons for change</li> </ul> <p><b>Information to be kept in a log for determining exemptions:</b></p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstrations that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul> <p><b>Information to be kept if equipped with a closed-vent system and control device:</b></p> <ul style="list-style-type: none"> <li>• periods when closed-vent system and control device are not operated according to design</li> <li>• dates of startup and shutdown of the closed-vent system and control device</li> </ul>

## COMPRESSORS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of compressors, excluding those designated for no detectable emissions or equipped with a compliant closed-vent system and control device</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information for each month in the reporting period:               <ul style="list-style-type: none"> <li>•• number of compressors for which leaks were detected</li> <li>•• number of compressors for which leaks were not repaired within 15 days after detection</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8.</li> </ul>



## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>For each dual mechanical seal system:</p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• connect the barrier fluid degassing reservoir by a closed-vent system to a control device, or</li> <li>• equip with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere</li> </ul> <p>For all dual mechanical seal systems:</p> <ul style="list-style-type: none"> <li>• the barrier fluid system shall be in heavy liquid service or not in VOC service</li> <li>• equip each barrier fluid system with a sensor that detects failure of seal system, barrier fluid system, or both                             <ul style="list-style-type: none"> <li>•• check each sensor daily or equip with audible alarm</li> </ul> </li> <li>• determine criteria for sensor and for dripping liquids that indicates failure of the seal system, the barrier fluid system, or both</li> <li>• perform weekly visual inspections for indications of liquids dripping from the pump seals</li> </ul> <p>Applies as an exemption to: Pumps in Light Liquid Service</p>
Leak Definition	Indications of liquids dripping from the pump seal or sensor detection
Alternative Standards	N/A
Exemptions	N/A
Monitoring Method	Visual, sensor
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p><i>Repair as soon as practicable; no later than 15 days after detection</i></p>
Delay of Repair	<p>If repair requires use of a dual mechanical seal system that includes a barrier fluid system and repair is completed as soon as practicable but no later than 6 months after leak detected</p> <p><i>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</i></p> <p><i>Allowed for equipment that is isolated from the process and that does not remain in VOC service</i></p>

# DUAL MECHANICAL SEAL SYSTEM

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all dual mechanical seal systems:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of equipment with dual mechanical seal systems</li> <li>• list of ID numbers of equipment in vacuum service</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to selected criteria and reasons for change</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information for each month in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of pumps for which leaks were detected</li> <li>•• number of pumps for which leaks were not repaired as required</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8</li> </ul>

## NO DETECTABLE EMISSIONS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Has an instrument reading of less than 500 ppm above background as measured by the methods specified in 60.485(c)</p> <p>Test for compliance initially upon designation, annually, and at other times as requested by the Administrator</p> <p>Applies as basic standard for:</p> <ul style="list-style-type: none"> <li>• pressure relief devices in gas/vapor service</li> </ul> <p>Applies as an alternate standard to:</p> <ul style="list-style-type: none"> <li>• pumps in light liquid service (must have no externally actuated shaft penetrating the pump housing)</li> <li>• valves in gas/vapor service or in light liquid service (must have no external actuating mechanism in contact with the process fluid)</li> </ul>
Leak Definition	< 500 ppm above background
Alternative Standards	N/A
Exemptions	N/A
Monitoring Method	Method 21
Repair Requirements	N/A
Delay of Repair	N/A

# NO DETECTABLE EMISSIONS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p><b>When leak detected:</b></p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after leak has been repaired</li> </ul> <p><b>Information to be kept in log for 2 years after leak detected:</b></p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p><b>Information to be kept:</b></p> <ul style="list-style-type: none"> <li>• list of ID numbers of equipment designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for equipment in vacuum service</li> <li>• list of ID numbers for pressure relief devices in gas/vapor service</li> </ul>
Reporting Requirements	<p><b>Semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• dates of process unit shutdowns that occurred within the semi-annual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8</li> </ul>

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Use cap, blind flange, plug, or second valve to seal open end at all times except when operations require flow through open end</p> <p>Second valve: close valve on process fluid end before closing second valve</p> <p>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</p>
Leak Definition	N/A
Alternative Standards	<i>Equivalent means of emission limitation</i>
Exemptions	Equipment in vacuum service
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all open-ended valves or lines:</p> <ul style="list-style-type: none"> <li>• list of ID number of subject open-ended valves or lines</li> <li>• list of ID numbers of equipment in vacuum service</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit ID</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	No detectable emissions (less than 500 ppm above background), except during pressure releases  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 (< 500 ppm above background)
Alternative Standards	N/A
Exemptions	Equipment in vacuum service  Pressure relief devices equipped with a compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)
Monitoring Method	Method 21
Repair Requirements	Return to condition of "no detectable emissions" as soon as practicable but no later than 5 calendar days after pressure release
Delay of Repair	Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown  Allowed for equipment that is isolated from the process and that does not remain in VOC service

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>Information to be kept for all pressure relief devices:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of pressure relief devices required to comply</li> <li>• list of ID numbers for no detectable emissions</li> <li>• for each compliance test for pressure relief devices designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• dates conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for pressure relief devices in vacuum service</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul> <p>Information to be kept if equipped with a closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• periods when closed-vent system and control device were not operated according to design</li> <li>• dates of startup and shutdown of the closed-vent system and control device</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit ID for pressure relief devices</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8.</li> </ul>

**PUMPS AND VALVES IN HEAVY LIQUID SERVICE, PRESSURE RELIEF DEVICES IN LIGHT LIQUID OR HEAVY LIQUID SERVICE, AND FLANGES AND OTHER CONNECTORS**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	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
Alternative Standards	Equivalent means of emission limitation
Exemptions	Equipment in vacuum service
Monitoring Method	Method 21
Repair Requirements	First attempt within 5 calendar days of detection  Repair as soon as practicable; no later than 15 days after detection
Delay of Repair	Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown  Allowed for equipment that is isolated from the process and that does not remain in VOC service.



**PUMPS AND VALVES IN HEAVY LIQUID SERVICE, PRESSURE RELIEF DEVICES IN LIGHT LIQUID OR HEAVY LIQUID SERVICE, AND FLANGES AND OTHER CONNECTORS**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be affected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all equipment in these categories:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject equipment in these categories</li> <li>• list of ID numbers for equipment in vacuum service</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• by month in the reporting period, the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8</li> </ul>

## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Monthly leak detection and repair</p> <p>Weekly visual observation for leaks</p>
Leak Definition	<p>10,000 ppm</p> <p>Indications of liquids dripping from pump seal</p>
Alternative Standards	<p>Equivalent means of emission limitation</p>
Exemptions	<p>Pumps in vacuum service</p> <p>Dual mechanical seal pumps (see Dual Mechanical Seals)</p> <p>Any pump designated for no detectable emissions (see No Detectable Emissions)</p> <p>Any pump equipped with a compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)</p>
Monitoring Method	<p>Method 21; no more than 1 cm from rotating shaft</p>
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown.</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VOC service</p> <p>Allowed if repair requires use of a dual mechanical seal system that includes a barrier fluid system and repair is completed as soon as practicable but not later than 6 months after leak was detected</p>

# PUMPS IN LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all pumps:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject pumps</li> <li>• list of ID numbers of pumps designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for pumps designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• identification of pumps in vacuum service</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation of selected criteria</li> <li>• any changes to selected criteria and reasons for change</li> </ul> <p>Information to be kept if pump is equipped with a closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• periods when closed-vent system and control device is not operating according to design</li> <li>• dates of startup and shutdown of closed-vent system and control device</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul>

## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of pumps, excluding those designated for no detectable emissions or equipped with a closed-vent system or control device</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information for each month in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of pumps for which leaks were detected</li> <li>•• number of pumps for which leaks were not repaired within 15 days after detection</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance test in accordance with §60.8</li> </ul>

## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	Equipped with closed-purged, closed-loop, or closed-vent system that returns the fluid to the process line, recycles the purged fluid to a process, or sends it to a compliant control device
Leak Definition	N/A
Alternative Standards	Equivalent means of emission limitation
Exemptions	<p>Equipment in vacuum service</p> <p>In-situ sampling systems</p> <p>Sampling systems without purges</p>
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all sampling connections:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject sampling connection systems</li> <li>• list of ID numbers of sampling connections systems in vacuum service</li> </ul> <p>Information to be kept if equipped with closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• periods when closed-vent system and control device is not operated according to design</li> <li>• dates of startup and shutdown of closed-vent system and control device</li> </ul> <p>Information to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul>

## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit ID</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>

## VALVES IN GAS/VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Monitor monthly</p> <p>If valve does not leak for 2 months, may be monitored quarterly</p> <p>If valve leaks, monitor monthly until no leak is detected for 2 consecutive months</p>
Leak Definition	10,000 ppm
Alternative Standards	<p>Equivalent means of emission limitation</p> <p>Allowable percentage of valves leaking: may elect to comply with <math>\leq 2\%</math> leaking valves</p> <ul style="list-style-type: none"> <li>• notify Administrator before implementing</li> <li>• conduct performance tests initially, annually, and as requested by Administrator                             <ul style="list-style-type: none"> <li>•• monitor within one week using Method 21</li> <li>•• leak definition is 10,000 ppm</li> <li>•• leak percentage cannot be greater than 2.0%</li> </ul> </li> </ul> <p>Skip period leak detection and repair:</p> <ul style="list-style-type: none"> <li>• notify Administrator before implementing</li> <li>• comply initially with basic standard</li> <li>• if <math>\leq 2\%</math> leaking after 2 consecutive quarterly leak detection periods, may begin to skip 1 of the quarterly monitoring periods</li> <li>• after 5 consecutive periods with <math>\leq 2.0\%</math> leaking, may begin to skip 3 of the quarterly periods</li> <li>• if <math>&gt; 2.0\%</math> leaking, comply with basic standard, but can again elect to use alternate standard</li> </ul>
Exemptions	<p>Valves in vacuum service</p> <p>Valves designated for no detectable emissions (less than 500 ppm above background - see No Detectable Emissions)</p> <p>Valves designated unsafe to monitor or difficult to monitor</p>
Monitoring Method	Method 21
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>

# VALVES IN GAS/VAPOR AND LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VOC service</p> <p>Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a compliant control device when repair occurs</p> <p>Allowed beyond process unit shutdown if otherwise sufficient supply of valve assembly replacements are exhausted and supplies had been sufficiently stocked before depletion</p> <p>Not allowed beyond next process unit shutdown unless next shutdown occurs sooner than 6 months after first process unit shutdown</p>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired and monitored for 2 months with no leaks detected during those 2 months</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject valves</li> <li>• list of ID numbers of valves designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for valves designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for valves in vacuum service</li> </ul> <p style="text-align: right;">(Continued on next page)</p>



## VALVES IN GAS/VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements, continued	<p>Information to be kept for unsafe or difficult to monitor valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers</li> <li>• explanation for designation</li> <li>• planned schedule for monitoring</li> </ul> <p>Information to be kept for valves complying with alternative standard - skip period leak detection and repair:</p> <ul style="list-style-type: none"> <li>• schedule of monitoring</li> <li>• percent of valves found leaking during each monitoring period</li> </ul> <p>Information and data to be kept in a log for determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of affected facility</li> <li>• demonstration that the feed or raw materials and products from the affected facility are heavy liquids or beverage alcohols</li> <li>• analysis demonstrating that equipment is not in VOC service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of valves, excluding those designated for no detectable emissions</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information for each month in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of valves for which leaks were detected</li> <li>•• number of valves for which leaks were not repaired within 15 days after detection</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with §60.8</li> </ul> <p>If complying with alternative standard, notify Administrator 90 days before implementation</p>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Control devices and closed-vent systems to be operated at all times that emissions may be vented to them</p> <p><b>Control Devices:</b></p> <ul style="list-style-type: none"> <li>• vapor recovery systems: 95 percent or greater recovery</li> <li>• enclosed combustion devices: 95 percent or greater reduction or minimum residence time of 0.50 seconds and minimum temperature of 760 °C</li> <li>• flares: comply with §60.18</li> <li>• monitor to ensure operated and maintained in conformance with their design</li> </ul> <p><b>Closed-Vent Systems:</b></p> <ul style="list-style-type: none"> <li>• no detectable emissions (less than 500 ppm above background) and no visual indications</li> <li>• monitor initially, annually, and at other times as requested by the Administrator</li> </ul>
Leak Definition	Closed-vent system: no detectable emissions (< 500 ppm above background) and visual inspection
Alternative Standards	Alternative means of emission limitation
Exemptions	Equipment in vacuum service
Monitoring Method	Method 21
Repair Requirements	<p>As soon as practicable, but no later than 15 calendar days after detection</p> <p>First attempt to repair within 5 calendar days of detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VHAP service</p>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>Information to be kept for all closed-vent systems and control devices:</p> <ul style="list-style-type: none"> <li>• detailed schematics, design specifications, and piping and instrumentation diagrams</li> <li>• dates and descriptions of any changes in design specifications</li> <li>• description of parameter(s) to be monitored to ensure proper operation and maintenance</li> <li>• explanation of selected parameter(s)</li> <li>• <i>periods when not operated according to design, including periods when a flare pilot light does not have a flame</i></li> <li>• dates of startups and shutdown of the closed-vent system and control device</li> <li>• list of ID numbers of subject closed-vent systems and control devices</li> <li>• list of ID numbers of closed-vent systems and control devices designated for no detectable emissions and signed by owner/operator</li> <li>• list of ID numbers for closed-vent systems and control devices in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• equipment identification number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• <i>process fluid state</i></li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests to determine compliance with no detectable emissions</li> <li>• by month in the reporting period, the facts that explain any delay of repairs and, where appropriate, why a process unit shutdown was technically infeasible</li> </ul>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Equip with compliant seal system that includes a barrier fluid system that prevents leakage to atmosphere</p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• connect the barrier fluid degassing reservoir by a closed-vent system to a control device, or</li> <li>• equip with a system that purges the barrier fluid into a process stream with zero VHAP emissions to the atmosphere</li> </ul> <p>The barrier fluid system is not in VHAP service and, if covered under 40 CFR 60, is not in VOC service</p> <p>Install sensor that will detect failure of seal system, barrier fluid system, or both</p> <ul style="list-style-type: none"> <li>• check each sensor daily or equip with audible alarm, unless at unmanned plant site</li> </ul> <p>Establish criteria that indicates failure of seal system, barrier fluid system, or both</p>
Leak Definition	Sensor indicates failure of seal system, barrier fluid system, or both, based on established criteria.
Alternative Standards	Alternative means of emission limitation
Exemptions	<p>Equipment in vacuum service</p> <p>Compressors designated for no detectable emissions, which operate less than 500 ppm above background (see No Detectable Emissions)</p> <p>Compressors equipped with a compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)</p>
Monitoring Method	Sensor alarm or visual check
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 calendar days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VHAP service</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all compressors:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject compressors</li> <li>• list of ID numbers of compressors designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for compressors designated for no detectable emissions:               <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for compressors in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p>Information to be kept for compressors equipped with a closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• periods when the closed-vent system and control device is not operated as designed, including periods when a flare pilot light does not have a flame</li> <li>• dates of start-up and shutdown of the closed-vent system and control device</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• equipment identification number</li> <li>• process unit number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• <i>method of compliance</i></li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information by month in the reporting period:               <ul style="list-style-type: none"> <li>•• number of compressors for which leaks were detected</li> <li>•• number of compressors for which leaks were not repaired within 15 days after detection</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests and monitoring to determine compliance with no detectable emissions</li> </ul>

## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>For each dual mechanical seal system:</p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• connect the barrier fluid degassing reservoir by a closed-vent system to a control device, or</li> <li>• equip with a system that purges the barrier fluid into a process stream with zero VHAP emissions to the atmosphere</li> </ul> <p>The barrier fluid system is not in VHAP service and, if covered under 40 CFR 60, is not in VOC service</p> <p>Equip each barrier fluid system with a sensor that will detect failure of seal system, barrier fluid system, or both</p> <ul style="list-style-type: none"> <li>• check each sensor daily or equip with audible alarm</li> <li>• if at unmanned site, visually inspect as often as practicable and at least monthly</li> </ul> <p>Determine criterion for sensor that indicates failure of the seal system, the barrier fluid system, or both</p> <p>Determine criteria for presence and frequency of drips that indicate failure</p> <p>Perform weekly visual inspections for indications of liquids dripping from the pump seal</p> <ul style="list-style-type: none"> <li>• if indications of liquid, monitor with Method 21 to determine presence of VOC and VHAP in barrier fluid</li> </ul> <p>Applies as an alternative standard to: Pumps in Light Liquid Service</p>
Leak Definition	<p>Sensor</p> <p>Presence of VHAP above background</p> <p>10,000 ppm total VOC</p> <p>Criteria</p>
Alternative Standards	N/A
Exemptions	N/A
Monitoring Method	Visual, sensor, Method 21
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>

## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>If repair requires use of a dual mechanical seal system that includes a barrier fluid system and repair is completed as soon as practicable but no later than 6 months after leak detected</p> <p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p><i>Allowed for equipment that is isolated from the process and that does not remain in VOC service</i></p>
Recordkeeping Requirements	<p><b>When leak is detected:</b></p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after leak has been repaired</li> </ul> <p><b>Information to be kept in log for 2 years after leak detected:</b></p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• <i>expected date of successful repair if leak is not repaired within the 15 days</i></li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p><b>Information to be kept for all dual mechanical seal systems:</b></p> <ul style="list-style-type: none"> <li>• list of ID numbers of dual mechanical seal systems</li> <li>• list of ID numbers designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for dual mechanical seal systems designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for dual mechanical seal systems in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p><b>Information to be kept for barrier fluid and seal systems:</b></p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p><b>Information to be kept for use in determining exemptions:</b></p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>



## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial report:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• <i>by month in the reporting period, the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</i></li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>

## NO DETECTABLE EMISSIONS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Has an instrument reading of less than 500 ppm above background as measured by the methods specified in 61.245(c)</p> <p>Test compliance initially upon designation, annually, and as requested by the Administrator</p> <p>Applies as basic standard for:</p> <ul style="list-style-type: none"> <li>• closed vent systems</li> <li>• pressure relief devices in gas/vapor service</li> </ul> <p>Applies as an alternate standard to:</p> <ul style="list-style-type: none"> <li>• pumps (must have no externally actuated shaft penetrating the pump housing)</li> <li>• valves (must have no external actuating mechanism in contact with the process fluid)</li> <li>• compressors</li> </ul>
Leak Definition	No detectable emissions (<500 ppm above background)
Alternative Standards	N/A
Exemptions	N/A
Monitoring Method	Method 21
Repair Requirements	N/A
Delay of Repair	N/A

# NO DETECTABLE EMISSIONS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak is detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after leak has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak.</li> </ul> <p>Information to be kept for all:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of equipment designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of IDs of equipment in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>
Reporting Requirements	<p>Semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit ID</li> <li>• dates of process unit shutdowns that occurred within the semi-annual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests and monitoring to determine compliance with no detectable emissions</li> </ul>

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Use cap, blind flange, plug, or second valve to seal open end at all times except when operations require flow through open end</p> <p>Second valve: close valve on process fluid end before closing second valve</p> <p>Double block and bleed system: bleed valve or line may remain open during venting operations that require venting the line between the block valves but comply with basic standard at all other times</p>
Leak Definition	N/A
Alternative Standards	Alternative means of emission limitation
Exemptions	Equipment in vacuum service
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all open-ended valves or lines:</p> <ul style="list-style-type: none"> <li>• list of ID number of subject open-ended valves or lines</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• equipment identification number</li> <li>• process unit number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit ID</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>No detectable emissions (less than 500 ppm above background)</p> <p>After each release, return to no detectable emissions within 5 calendar days as indicated by monitoring of the pressure relief device</p>
Leak Definition	No detectable emissions (< 500 ppm above background)
Alternative Standards	N/A
Exemptions	<p>Equipment in vacuum service</p> <p>Any pressure relief device equipped with a compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)</p>
Monitoring Method	Method 21
Repair Requirements	Return to condition of "no detectable emissions" as soon as practicable but no later than 5 calendar days after pressure release
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VHAP service</p>

# PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>Information to be kept for all pressure relief devices:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject pressure relief devices</li> <li>• list of ID numbers of pressure relief devices for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for pressure relief devices designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for pressure relief devices in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for pressure relief devices equipped with a closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• periods when the closed-vent system and control device is not operated as designed, including periods when a flare pilot light does not have a flame</li> <li>• dates of start-up and shutdown of the closed-vent system and control device</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• equipment identification number</li> <li>• process unit number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests and monitoring to determine compliance with no detectable emissions</li> </ul>

**PRESSURE RELIEF DEVICES IN LIQUID SERVICES,  
FLANGES AND OTHER CONNECTORS**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	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
Alternative Standards	Alternative means of emission limitation
Exemptions	Equipment in vacuum service
Monitoring Method	Method 21
Repair Requirements	First attempt within 5 calendar days of detection  Repair as soon as practicable; no later than 15 days after detection
Delay of Repair	Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown  Allowed for equipment that is isolated from the process and that does not remain in VHAP service.
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq</math> 10,000 ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul>

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**PRESSURE RELIEF DEVICES IN LIQUID SERVICES,  
FLANGES AND OTHER CONNECTORS**

APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
<b>Recordkeeping Requirements (continued)</b>	<p>Information to be kept for all pressure relief devices, flanges and other connectors:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject pressure relief devices, flanges and other connectors</li> <li>• list of ID numbers for equipment in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>
<b>Reporting Requirements</b>	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• equipment identification number</li> <li>• process unit number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>

## PRODUCT ACCUMULATOR VESSELS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	Equip with a compliant closed-vent system and control device
Leak Definition	N/A
Alternative Standards	Alternative means of emission limitation
Exemptions	Equipment in vacuum service
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all product accumulator vessels:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject product accumulator vessels</li> <li>• list of ID numbers for product accumulator vessels in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> <li>• periods when the closed-vent system and control device are not operated as designed, including periods when a flare pilot light does not have a flame</li> <li>• dates of startups and shutdowns of the closed-vent system and control device</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>

## PRODUCT ACCUMULATOR VESSELS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial report:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• equipment identification number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>

## PUMPS IN VHAP SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Monthly monitoring</p> <p>Weekly visual observation for dripping liquids</p>
Leak Definition	<p>10,000 ppm</p> <p>Indications of liquids dripping from pump seal</p>
Alternative Standards	Alternative means of emission limitation
Exemptions	<p>Pumps designated for no detectable emissions (see No Detectable Emissions)</p> <p>Pumps equipped with a compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)</p> <p>Pumps equipped with a dual mechanical seal (see Dual Mechanical Seals)</p> <p>Pumps in vacuum service</p> <p>Any pump located at unmanned site is exempt from weekly visual inspections and daily sensor checks provided each pump is visually inspected as often as practicable and at least monthly</p>
Monitoring Method	Method 21; no more than 1 cm from rotating shaft
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VHAP service</p> <p>Allowed if repair requires use of a dual mechanical seal system that includes a barrier fluid system and repair is completed as soon as practicable but not later than 6 months after leak was detected</p>

## PUMPS IN VHAP SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all pumps:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject pumps</li> <li>• list of ID numbers of pumps designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for pumps designated for no detectable emissions:               <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of pumps in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p>Information to be kept for pumps equipped with a closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• periods when the closed-vent system and control device is not operated as designed, including periods when a flare pilot light does not have a flame</li> <li>• dates of start-up and shutdown of the closed-vent system and control device</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>

## PUMPS IN VHAP SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial report:</b></p> <ul style="list-style-type: none"> <li>• equipment identification number</li> <li>• process unit number</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information by month in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of pumps for which leaks were detected</li> <li>•• number of pumps for which leaks were not repaired within 15 days after detection</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests and monitoring to determine compliance with no detectable emissions.</li> </ul>

## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	Equip with closed-purge system or closed-vent system that returns the fluid to the process line with zero VHAP emissions to the atmosphere, recycles the purged fluid with zero VHAP emissions to the atmosphere, or sends it to a compliant control device
Leak Definition	N/A
Alternative Standards	Alternative means of emission limitation
Exemptions	<i>Equipment in vacuum service</i>  <i>In-situ sampling systems</i>
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all sampling connections:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject sampling connection systems</li> <li>• periods when the closed-vent system and control device are not operated as designed, including periods when a flare pilot light does not have a flame</li> <li>• dates of startups and shutdowns of the closed-vent system and control device</li> <li>• list of ID numbers of equipment in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• <i>analysis demonstrating design capacity of the process unit</i></li> <li>• <i>analysis demonstrating that equipment is not in VHAP service</i></li> </ul>

## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• <i>equipment identification number</i></li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit ID</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> </ul>



## VALVES IN VHAP SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Monthly monitoring</p> <p>If valve does not leak for 2 months, may be monitored quarterly</p> <p>If leak detected, monitor monthly until no leak is detected for 2 consecutive months</p>
Leak Definition	10,000 ppm
Alternative Standards	<p>Alternative means of emission limitation</p> <p>Allowable percentage of valves leaking: may elect to comply with <math>\leq 2\%</math> leaking valves</p> <ul style="list-style-type: none"> <li>• notify Administrator before implementing</li> <li>• conduct performance tests initially, annually, and as requested by Administrator                             <ul style="list-style-type: none"> <li>•• monitor within one week using Method 21</li> <li>•• leak definition is 10,000 ppm</li> <li>•• leak percentage cannot be greater than 2.0%</li> </ul> </li> <li>• notify Administrator if no longer complying with alternate standard</li> </ul> <p>Skip period leak detection and repair:</p> <ul style="list-style-type: none"> <li>• notify Administrator before implementing</li> <li>• comply initially with basic standard</li> <li>• if <math>\leq 2\%</math> leaking after 2 consecutive quarterly leak detection periods, may begin to skip 1 of the quarterly monitoring periods</li> <li>• after 5 consecutive periods with <math>\leq 2.0\%</math> leaking, may begin to skip 3 of the quarterly periods</li> <li>• if <math>&gt; 2.0\%</math> leaking, comply with basic standard, but can again elect to use alternate standard</li> </ul>
Exemptions	<p>Valves in vacuum service</p> <p>Valves designated for no detectable emissions (less than 500 ppm above background) (see No Detectable Emissions)</p> <p>Valves designated unsafe to monitor or difficult to monitor</p>
Monitoring Method	Method 21
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>

# VALVES IN VHAP SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in VHAP service</p> <p>Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a control device when repair occurs</p> <p>Allowed beyond process unit shutdown if otherwise sufficient supply of valve assembly replacements are exhausted</p> <p>Not allowed beyond next process unit shutdown unless next process unit shutdown occurs sooner than 6 months after first process unit shutdown</p>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired and monitored for 2 months with no leaks</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject valves</li> <li>• list of ID numbers of valves designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for valves designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for valves in vacuum service</li> <li>• information and data used to demonstrate equipment is not in VHAP service</li> </ul> <p>Information to be kept for unsafe or difficult to monitor valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers</li> <li>• explanation for designation</li> <li>• planned schedule for monitoring</li> </ul> <p style="text-align: right;">(Continued on next page)</p>

## VALVES IN VHAP SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements, continued	<p>Information to be kept for valves complying with alternate standard - skip period leak detection and repair:</p> <ul style="list-style-type: none"> <li>• schedule of monitoring</li> <li>• percent of valves found leaking during each monitoring period</li> </ul> <p>Information to be kept for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis demonstrating design capacity of the process unit</li> <li>• analysis demonstrating that equipment is not in VHAP service</li> </ul>
Reporting Requirements	<p>Initial report:</p> <ul style="list-style-type: none"> <li>• valve ID number</li> <li>• process unit identification</li> <li>• type of equipment</li> <li>• percent weight VHAP</li> <li>• process fluid state</li> <li>• method of compliance</li> <li>• reporting schedule for submittal of subsequent semiannual reports</li> <li>• statement notifying Administrator that subpart requirements are being implemented</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• the following information by month in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of valves for which leaks were detected</li> <li>•• number of valves for which leaks were not repaired within 15 days after detection</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• report of all performance tests in accordance with no detectable emissions</li> </ul>

# AGITATORS IN GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>"Non-dual mechanical seal" agitators:</p> <ul style="list-style-type: none"> <li>• monthly monitoring and weekly visual check for indications of dripping liquid</li> <li>• if at unmanned site, visually inspect as often as practicable and at least monthly</li> </ul>
Leak Definition	<p>Monitoring: 10,000 ppm</p> <p>Visual: indications of liquids dripping from agitator</p>
Alternative Standards	<p><i>Enclosed-vented process units: may enclose process units and operate under negative pressure while venting all leaks from equipment through a closed-vent system to a control device meeting the requirements of this rule.</i></p> <p>Batch processes: may pressure test or monitor equipment for leaks</p>
Exemptions	<p>Dual mechanical seal agitators (see Dual Mechanical Seal Systems)</p> <p>Agitators designed with no externally actuated shaft penetrating the agitator housing</p> <p>Agitators equipped with closed-vent system and control device (see Closed-vent Systems and Control Devices)</p> <p>Agitators located at unmanned plant site are exempt from weekly visual inspection and daily sensor check if visually inspected as often as practical and at least monthly</p> <p>Difficult to monitor agitators exempt if:</p> <ul style="list-style-type: none"> <li>• agitator cannot be monitored without elevating personnel more than 2 meters above a support surface or if it is not accessible at any time in a safe manner,</li> <li>• process unit where agitator is located is an existing source or &lt;3% of total number of agitators in a new source are designated difficult to monitor, and</li> <li>• written plan requires monitoring at least once per calendar year</li> </ul> <p>Unsafe to monitor agitators are exempt if:</p> <ul style="list-style-type: none"> <li>• monitoring personnel would be exposed to an immediate danger, and</li> <li>• written plan requires monitoring as frequently as practical during safe to monitor times, but not more frequently than monitoring schedule</li> </ul> <p>Agitators obstructed by equipment or piping that prevents access by a monitor probe</p> <p>Equipment in vacuum service</p> <p>Equipment operated fewer than 300 hours per year in organic HAP service</p>
Monitoring Method	<p>Method 21; no more than 1 cm from rotating shaft</p> <ul style="list-style-type: none"> <li>• response factor criteria (excluding inerts) for average composition of process fluid</li> <li>• monitor all equipment while it is "in service"</li> </ul>

## AGITATORS IN GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p> <p>Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a control device when repair occurs</p>

# AGITATORS IN GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or determination the equipment is nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• copies of periodic reports (if database not capable of generating)</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all agitators:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject equipment</li> <li>• location of equipment on site plan, log entries, etc.</li> <li>• list of ID numbers of equipment equipped with closed-vent system and control device</li> <li>• documentation and dates of visual inspections</li> </ul> <p>Information to be kept for agitators with dual mechanical seal system:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for changes</li> </ul> <p>Information to be kept for unsafe to monitor agitators:</p> <ul style="list-style-type: none"> <li>• identification of equipment designated as unsafe to monitor</li> <li>• plan for monitoring</li> </ul> <p>Information to be kept for difficult to monitor agitators:</p> <ul style="list-style-type: none"> <li>• list of ID numbers for equipment designated as difficult to monitor</li> <li>• explanation of designation</li> <li>• planned schedule for monitoring</li> </ul> <p>Information and data used to demonstrate that equipment is not in organic HAP service, is in HAP service fewer than 300 hours/year, or is in heavy liquid service</p>

# AGITATORS IN GAS/VAPOR SERVICE OR LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of compliance status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of agitators (excluding those in vacuum service)</li> <li>• method of compliance</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• the following information for each monitoring period during the 6-month reporting period:                             <ul style="list-style-type: none"> <li>•• number of agitators for which leaks were detected</li> <li>•• number of agitators for which leaks were not repaired as required</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• revisions to items reported in the notification of compliance status if method of compliance has changed since the last report</li> <li>• information listed under notification of compliance status for process units with later compliance dates</li> </ul>

**ALTERNATIVE MEANS OF EMISSION LIMITATION:  
ENCLOSED-VENTED PROCESS UNITS**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	Process units enclosed in such a manner that all emissions from equipment leaks are vented through a closed-vent system to a control device. The enclosures shall be maintained under negative pressure at all times the process unit is in operation
Recordkeeping Requirements	Owner/operators shall maintain the following records: <ul style="list-style-type: none"> <li>• ID numbers of the process units and the organic HAPs they handle</li> <li>• a schematic of the process unit, enclosure, and closed vent system</li> <li>• a description of the system used to create a negative pressure in the enclosure to ensure that all emissions are routed to the control device</li> </ul>
Reporting Requirements	Information for each process unit: <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• description of the system used to create a negative pressure in the enclosure and the control device used</li> </ul>



**ALTERNATIVE MEANS OF EMISSION LIMITATION:  
BATCH PROCESSES**

APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS																											
Basic Standard (Alternative)	1) Batch pressure test or 2) Meet standards for continuous processes with changes to monitoring																											
Monitoring Options	1) Batch pressure testing: <ul style="list-style-type: none"> <li>• test batch process equipment using either:               <ul style="list-style-type: none"> <li>•• procedures specified for pressure or vacuum loss [see §63.180(f)] or</li> <li>•• with a liquid using procedures specified in §63.180(g)</li> </ul> </li> <li>• each time equipment is reconfigured for production of a different product or intermediate, the batch product-process equipment train shall be pressure tested for leaks before organic HAP is first fed to the equipment and the equipment is placed in organic HAP service</li> <li>• when the batch product-process train is reconfigured to produce a different product, pressure testing is required only for the new or disturbed equipment</li> <li>• each batch process that operates in organic HAP service during a calendar year must be pressure tested at least once during that calendar year</li> <li>• pressure testing is not required for routine seal breaks, such as changing hoses or filters, which are not part of the reconfiguration to produce a different product or intermediate</li> <li>• for pressure tests using a gas or a vacuum, a leak is found if the rate of pressure change exceeds 1 psig in 1 hour or if there is visible, audible, or olfactory evidence of fluid loss</li> <li>• for pressure tests using a liquid, a leak is defined as dripping liquid or other evidence of fluid loss from process units</li> </ul> 2) Continuous process monitoring method: <ul style="list-style-type: none"> <li>• 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 in use with any other detectable gas or vapor</li> <li>• each time the equipment is reconfigured for the production of a new product, the reconfigured equipment shall be monitored for leaks within 30 days of start-up of the process; this initial monitoring of reconfigured equipment shall not be included in determining percent leaking equipment in the process unit.</li> <li>• connectors are to be monitored in accordance with §63.174</li> <li>• monitor equipment other than connectors at the frequencies specified in the following schedule:</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th align="center" colspan="4">EQUIPMENT MONITORING FREQUENCIES (other than connectors)</th> </tr> <tr> <th align="center" rowspan="2">Time in Use (% of year)</th> <th align="center" colspan="3">Equivalent Continuous Process Monitoring Frequency</th> </tr> <tr> <th align="center">Monthly</th> <th align="center">Quarterly</th> <th align="center">Semiannually</th> </tr> </thead> <tbody> <tr> <td align="center">0 to &lt;25</td> <td align="center">quarterly</td> <td align="center">annually</td> <td align="center">annually</td> </tr> <tr> <td align="center">25 to &lt;50</td> <td align="center">quarterly</td> <td align="center">semiannually</td> <td align="center">annually</td> </tr> <tr> <td align="center">50 to &lt;75</td> <td align="center">bimonthly</td> <td align="center">three times/year</td> <td align="center">semiannually</td> </tr> <tr> <td align="center">75 to 100</td> <td align="center">monthly</td> <td align="center">quarterly</td> <td align="center">semiannually</td> </tr> </tbody> </table>	EQUIPMENT MONITORING FREQUENCIES (other than connectors)				Time in Use (% of year)	Equivalent Continuous Process Monitoring Frequency			Monthly	Quarterly	Semiannually	0 to <25	quarterly	annually	annually	25 to <50	quarterly	semiannually	annually	50 to <75	bimonthly	three times/year	semiannually	75 to 100	monthly	quarterly	semiannually
EQUIPMENT MONITORING FREQUENCIES (other than connectors)																												
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40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Repair Requirements	<p>Batch:</p> <ul style="list-style-type: none"> <li>• when leaks are detected, repairs must be made and a retest conducted before startup of the process</li> <li>• 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 second pressure test</li> </ul> <p>Continuous:</p> <ul style="list-style-type: none"> <li>• If a leak is detected, it shall be repaired as soon as practicable but not later than 15 calendar days after it is detected</li> </ul>
Delay of Repair	<p>Allowed if the replacement equipment is not available, providing the following conditions are met</p> <ul style="list-style-type: none"> <li>• equipment supplies have been depleted and supplies had been sufficiently stocked before the supplies were depleted</li> <li>• the repair is made no later than 10 calendar days after delivery of the replacement equipment</li> </ul>

**ALTERNATIVE MEANS OF EMISSION LIMITATION:  
BATCH PROCESSES**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping	<p>For each component, all other elements of the rule (leak definition, records, reports, etc.) apply the same as for continuous processes</p> <p>Identify equipment on a plant site plan, in log entries, or by other appropriate methods</p> <p>List of equipment added since last monitoring period</p> <p>Documentation of any switch from batch process monitoring to pressure testing or vice versa</p> <p>Record that inspection was performed if no leaks are found</p> <p>Records of any visible, audible, or olfactory evidence of fluid loss</p> <p><b>Batch pressure testing:</b></p> <ul style="list-style-type: none"> <li>• batch products or product codes for equipment subject to this monitoring option</li> <li>• identification of each product or product code produced during the calendar year; it is not necessary to identify individual items of equipment in a batch product process equipment train</li> <li>• records demonstrating the proportion of the time during the calendar year the equipment is in use in a batch process; examples of suitable documentation are records of time in use for individual pieces of equipment or average time in use for the process unit</li> <li>• the dates of each pressure test, the test pressure, and the pressure drop observed during the test</li> </ul> <p>When a batch product process equipment train does not pass two consecutive pressure tests, the following information shall be recorded in a log and kept for 2 years:</p> <ul style="list-style-type: none"> <li>• the date of each pressure test and the date of each leak repair attempt</li> <li>• repair methods applied in each attempt to repair the leak</li> <li>• the reason for the delay of repair</li> <li>• the expected date for delivery of the replacement equipment and the actual date of delivery of the replacement equipment</li> <li>• the date of successful repair</li> </ul> <p><b>Continuous process monitoring:</b></p> <ul style="list-style-type: none"> <li>• records demonstrating the proportion of the time during the calendar year the equipment is in use in a batch process; examples of suitable documentation are records of time in use for individual pieces of equipment or average time in use for the process unit; these records are not required if the owner or operator does not adjust monitoring frequency by the time in use</li> <li>• date and results of monitoring for equipment added to the batch process unit since the last monitoring period.</li> </ul>

**ALTERNATIVE MEANS OF EMISSION LIMITATION:  
BATCH PROCESSES**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting	<p>Notification of compliance status:</p> <ul style="list-style-type: none"> <li>• batch products or product codes designated for pressure testing and</li> <li>• a planned schedule for pressure testing when equipment is configured for production of products subject to provisions of subpart.</li> </ul> <p>Periodic reports:</p> <ul style="list-style-type: none"> <li>• batch product process equipment train identification</li> <li>• the number of pressure tests conducted</li> <li>• the number of pressure tests where the equipment train failed the pressure test</li> <li>• the facts that explain any delay of repairs</li> <li>• the results of all monitoring to determine compliance of closed-vent systems</li> </ul>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Control devices and closed-vent systems: operate whenever HAP emissions may be vented to them</p> <p>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.</p> <p><u>Recovery or Recapture Devices:</u></p> <p>Vapor recovery systems: 95 percent or greater recovery or an exit concentration of 20 ppmv, whichever is less stringent</p> <p>Enclosed combustion devices: 95% or more reduction, or 20 ppmv on any basis, corrected to 3% O<sub>2</sub>, whichever is less stringent, or minimum residence time/temp: 0.50 sec. &amp; 760° C</p> <p>Flares: Comply with §63.11(b)</p> <p><u>Closed-Vent Systems:</u></p> <p>Initial and annual inspection requirements:</p> <ul style="list-style-type: none"> <li>• hard pipe construction: initial inspection per Method 21, annual visual inspections for visual, olfactory or audible leaks</li> <li>• duct work construction: initial and annual inspections per Method 21</li> </ul>
Leak Definition	<p>No detectable emissions (&lt; 500 ppm above background)</p> <p>Visual inspections</p>
Alternative Standard	Alternative means of emission limitation

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Exemptions	<p>Equipment in vacuum service</p> <p>Equipment in organic HAP service fewer than 300 hours per year</p> <p>Equipment such as low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and pressure relief valves needed for safety purposes exempt from monitoring requirements</p> <p>"Unsafe to inspect" parts are exempt from §63.180(b) inspections if:</p> <ul style="list-style-type: none"> <li>• inspecting personnel would be exposed to an imminent or potential danger, and</li> <li>• the owner or operator has a written plan requiring inspection during safe to inspect times as frequently as practicable but not more than once per year</li> </ul> <p>"Difficult to inspect" parts are exempt from §63.180(b) inspections if:</p> <ul style="list-style-type: none"> <li>• the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface, and</li> <li>• the owner or operator has a written plan requiring inspection of the equipment at least once every 5 years</li> </ul>
Monitoring Method	<p>Monitor control devices to ensure operated &amp; maintained in conformance with design specifications</p> <p>By-pass lines:</p> <ul style="list-style-type: none"> <li>• install, set or adjust and maintain vent stream flow indicator installed at entrance to any bypass line or</li> <li>• secure valve in non-diverting position with car-seal or lock-and-key type locks with monthly visual inspection</li> </ul> <p>Method 21:</p> <ul style="list-style-type: none"> <li>• response factor criteria (excluding inerts) for average composition of process fluid</li> <li>• monitor all equipment while it is "in service"</li> </ul>
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service.</p>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after equipment has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, and ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or if determined to be nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• copies of periodic reports (if database not capable of generating)</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all closed-vent systems and control devices:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject equipment</li> <li>• location of equipment on site plan, log entries, etc.</li> <li>• list of ID numbers for components equipped with closed-vent system and control device</li> <li>• ID of surge control vessels and bottoms receivers equipped with closed-vent system and control device</li> <li>• documentation of visual inspections</li> <li>• design specifications (retain for life of equipment)                             <ul style="list-style-type: none"> <li>•• design specifications and performance demonstrations to include detailed schematics and piping and instrumentation diagrams</li> <li>•• dates and descriptions of any changes in the design specifications</li> <li>•• flare design and results of compliance demonstration</li> <li>•• description and explanation of control device monitoring parameters</li> </ul> </li> <li>• records of operation (retain for 2 years)                             <ul style="list-style-type: none"> <li>•• dates and durations when closed-vent system and control device is not operated as designed (includes lack of flame in flare pilot light) and when monitoring systems/devices are nonoperative</li> <li>•• dates and durations of start-ups and shutdowns of control devices</li> </ul> </li> <li>• records of inspections (retain for 2 years)                             <ul style="list-style-type: none"> <li>•• if no leaks detected: record date and fact of inspection and statement no leaks detected</li> <li>•• if leaks detected: information specified previously</li> </ul> </li> </ul> <p>Information and data used to demonstrate that a closed-vent system and control device is not in organic HAP service or is in HAP service fewer than 300 hours/year</p>

# CLOSED-VENT SYSTEMS AND CONTROL DEVICES

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial notification:</p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p>Notification of compliance status:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of closed-vent system and control device, excluding those in vacuum service</li> <li>• method of compliance</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• the facts that explain any delay of repairs</li> <li>• the results of all monitoring of closed-vent systems or of control devices</li> <li>• revisions to items reported in the initial compliance notice if method of compliance has changed since the last report</li> <li>• if applicable, the compliance option selected for closed-vent systems and control devices</li> </ul>



# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Equip with compliant seal system that includes a barrier fluid system that prevents leakage to atmosphere</p> <p>For each compressor seal system:</p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• equip with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed-vent system to a control device, or</li> <li>• equip with a closed-loop system that purges the barrier fluid into a process stream</li> </ul> <p>The barrier fluid system is not in light liquid service</p> <p>Install sensor to detect failure of seal system, barrier fluid system, or both</p> <p>Check sensor daily or equip with audible alarm, unless at an unmanned plant site</p> <p>Establish criteria that indicates failure of seal system or barrier fluid system or both</p>
Leak Definition	Sensor indicates failure of seal or barrier fluid system or both based on established criteria
Alternative Standards	<p>Alternative means of emission limitation</p> <p>Enclosed-vented process units: may enclose process units and operate under negative pressure while venting all leaks from equipment through a closed-vent system to a control device meeting the requirements of the rule</p> <p>Batch processes: may pressure test or monitor equipment for leaks</p>
Exemptions	<p>Compressors designated to operate with instrument reading of less than 500 ppm above background (see No Detectable Emissions)</p> <p>Compressors equipped with closed-vent system; returns to a process, fuel gas system or compliant control device (see Closed-vent Systems and Control Devices)</p> <p>Compressors in vacuum service</p> <p>Compressors operated fewer than 300 hours per year in organic HAP services</p>
Monitoring Method	Daily observation of sensors or use of sensor alarm system
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 calendar days after detection</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or determination to be nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• dates of process unit shutdowns that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all compressors:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject compressors</li> <li>• location of compressor on site plan, log entries, etc.</li> <li>• list of ID numbers of compressors equipped with closed-vent system and control device</li> <li>• list of ID numbers of compressors designated to operate at less than 500 ppm above background</li> <li>• documentation and dates of visual inspections</li> <li>• for each compliance test for compressors designated to operate at less than 500 ppm above background:               <ul style="list-style-type: none"> <li>•• date conducted and results of test</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• copies of periodic reports (if database not capable of generating)</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p>Information and data used to demonstrate that a compressor is not in organic HAP service or is in HAP service fewer than 300 hours/year</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial notification:</p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p>Notification of compliance status:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of compressors (excluding those in vacuum service)</li> <li>• method of compliance</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• the following information for each monitoring period during the 6-month period:               <ul style="list-style-type: none"> <li>•• number of compressors for which leaks were detected</li> <li>•• number of compressors for which leaks were not repaired as required</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• results of monitoring for compressors designated to operate at less than 500 ppm</li> <li>• revisions to items reported in the notification of compliance status if method of compliance has changed since the last report</li> <li>• information listed under Notification of Compliance for process units with later compliance dates</li> </ul>

## CONNECTORS IN GAS/VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Initial survey:</p> <ul style="list-style-type: none"> <li>• Monitor all connectors within first 12 months after initial start-up (new sources)</li> <li>• Monitor all connectors no later than 12 months after compliance date (existing)</li> </ul> <p>Subsequent monitoring frequency based on percent leaking:</p> <ul style="list-style-type: none"> <li>• Annual: if <math>\geq 0.5\%</math> during last annual or biennial period</li> <li>• Once every 2 years: if <math>&lt; 0.5\%</math> during last monitoring period (monitor at least 40% of connectors in first year and remainder in second year)</li> <li>• Once every 4 years: if <math>&lt; 0.5\%</math> during 2 year monitoring period (monitor at least 20% per year until all are monitored within 4 years)</li> <li>• Once every 2 years: 0.5 to <math>&lt; 1\%</math> during 4 year monitoring period (monitor at least 40% of connectors first year and remainder in second year)</li> <li>• Annual: if <math>&gt; 1\%</math> during 4 year monitoring period</li> </ul> <p>For any connector that has been opened or otherwise has had its seal broken, monitor when reconnected or within first 3 months of being returned to HAP service.</p> <p>If leak is detected and it cannot be repaired, then the connector should be counted as nonrepairable for purposes of determining monitoring frequency. If the owner or operator chooses not to monitor connectors that have been opened or otherwise had the seal broken, then he cannot count nonrepairable connectors for the purposes of determining monitoring frequency. The owner or operator will instead set the nonrepairable component of the monitoring frequency equation to zero for all monitoring periods.</p> <p>A switch in alternatives requires initial monitoring no later than 12 months after reporting the switch.</p>
Leak Definition	500 ppm (except for inaccessible, ceramic, or ceramic-lined connectors)
Alternative Standards	<p>Alternative means of emission limitation</p> <p>Alternative requirements allowed for screwed connectors less than 2 inches in nominal inside diameter; may comply with 63.169 and monitor within first 3 months of return to organic HAP service after being opened or having seal otherwise broken</p> <p>Alternative requirements for connectors that have had the seal broken or otherwise been opened (see Basic Standard above)</p>

## CONNECTORS IN GAS/VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Exemptions	<p>Connectors in vacuum service</p> <p>Connectors in organic HAP service fewer than 300 hours per year</p> <p>"Unsafe-to-monitor" connectors: monitor as frequently as practicable during safe to monitor periods, but no more frequently than the periodic schedule otherwise applicable</p> <p>"Unsafe-to-repair" connectors: repair by end of the next scheduled process unit shutdown</p> <p>"Inaccessible" or "ceramic" or "ceramic-lined" connectors: repair any leak observed by visual, audible, olfactory or other means</p>
Monitoring Method	<p>Method 21</p> <ul style="list-style-type: none"> <li>• response factor criteria (excluding inerts) for average composition of process fluid</li> <li>• monitor all equipment while it is "in service"</li> </ul>
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p> <p>When repaired, monitor at least once within first 3 months of repair</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed if emissions of purged materials from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a control device when repair occurs</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p>
Calculation of Percent Leaking	<p>For the first monitoring period:</p> <ul style="list-style-type: none"> <li>• percent leaking connectors = <math>\frac{\text{number of connectors measured at 500 ppm or greater}}{\text{total number of measured connectors in the process unit} + \text{optional credit for removed connectors}} \cdot 100</math></li> </ul> <p>For subsequent monitoring periods:</p> <ul style="list-style-type: none"> <li>• percent leaking connectors = <math>\frac{\text{number of connectors measured at 500 ppm or greater} - \text{number of allowable nonrepairable connectors}}{\text{total number of monitored connectors in the process unit} + \text{optional credit for removed connectors}} \cdot 100</math></li> </ul>

# CONNECTORS IN GAS/VAPOR AND LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
<p>Optional Credit for Removed Connectors</p>	<p>Credit may be given for eliminating connectors if the following requirements are met:</p> <ul style="list-style-type: none"> <li>• connector was welded after the date of proposal of the specific subpart that references this subpart</li> <li>• integrity of the weld is demonstrated by monitoring it according to the procedures in 63.180(b) or by testing using X-ray, acoustic monitoring, hydrotesting, or other applicable method</li> <li>• welds created after the date of proposal but before the date of promulgation of a specific subpart that references this subpart are monitored or tested by 3 months after the compliance date specified in the applicable subpart, and</li> <li>• welds created after promulgation of the subpart that references this subpart are monitored or tested within 3 months after being welded</li> </ul> <p>If an inadequate weld is found or the connector is not welded completely around the circumference, the connector is not considered a welded connector and is therefore not exempt.</p> <p>In percent leaking connectors equations, optional credit for removed connectors is calculated:  <math>0.67 * \text{net (total removed - total added) number of connectors in organic HAP service that are removed from the process unit after compliance date for existing units and after initial start-up for new units. If credits are not taken, the credit} = 0</math></p>

## CONNECTORS IN GAS/VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p><b>When leak detected:</b></p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired and monitored when reconnected or within first 3 months of repair and no leak is detected</li> </ul> <p><b>Information to be kept in log for 2 years after leak detected:</b></p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or determination as nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• dates of process unit shutdowns that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> <li>• dates and results of monitoring</li> </ul> <p><b>Information to be kept for all connectors:</b></p> <ul style="list-style-type: none"> <li>• identification of connectors, by area or grouping, with total number of connectors within each group</li> <li>• ID of screwed connectors, by area or grouping, with total number of screwed connectors with each group</li> <li>• location of areas or groups on site plan, log entries, etc.</li> <li>• schedule by process unit for monitoring connectors</li> <li>• list of connectors removed and added if net credits for their removal are expected to be used</li> <li>• list of ID numbers for connectors in vacuum service</li> <li>• documentation of the integrity of the weld for removed connectors</li> <li>• copies of periodic reports (if database not capable of generating)</li> <li>• ID of connectors open or otherwise had the seal broken since the last monitoring period, and dates and results of follow-up monitoring</li> </ul> <p><b>Information to be kept for unsafe to monitor connectors:</b></p> <ul style="list-style-type: none"> <li>• identification of equipment designated as unsafe to monitor</li> <li>• plan for monitoring</li> </ul> <p><b>Information to be kept for unsafe to repair connectors:</b></p> <ul style="list-style-type: none"> <li>• list of ID numbers</li> <li>• explanation for designation</li> </ul> <p><b>Information to be kept for inaccessible, ceramic, and ceramic-lined connectors:</b></p> <ul style="list-style-type: none"> <li>• exempt from recordkeeping requirements</li> </ul> <p>Information and data used to demonstrate that connectors are not in organic HAP service, are in HAP service fewer than 300 hours/year, or are in heavy liquid service</p>

# CONNECTORS IN GAS/VAPOR AND LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of compliance status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of connectors, excluding those in vacuum service</li> <li>• method of compliance</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• number of connectors and screwed connectors for which leaks were detected</li> <li>• total number of connectors and screwed connectors monitored</li> <li>• the percent leakers for connectors and screwed connectors</li> <li>• number of connectors and screwed connectors for which leaks were not repaired within 15 days after detection</li> <li>• identification of the number of connectors determined to be nonrepairable</li> <li>• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> <li>• notification of change in connector monitoring alternatives (if applicable)</li> <li>• revisions to items reported in the initial report if method of compliance has changed since the last report</li> <li>• initiation of monthly monitoring under Phase III or QIP (if applicable)</li> <li>• information listed under notification of compliance status for process units with later compliance dates</li> </ul> <p>Inaccessible, ceramic, and ceramic-lined connectors exempt from reporting requirements</p>



## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
<b>Basic Standard</b>	<p><i>For each dual mechanical seal system:</i></p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• equip with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed-vent system to a control device, or</li> <li>• equip with a closed-loop system that purges the barrier fluid into a process stream</li> </ul> <p><i>For all dual mechanical seal systems:</i></p> <ul style="list-style-type: none"> <li>• the barrier fluid system is not in light liquid service</li> <li>• barrier fluid system is equipped with a sensor to detect failure of seal system, barrier fluid system, or both                             <ul style="list-style-type: none"> <li>•• check each sensor daily or equip with audible alarm unless located at unmanned site</li> <li>•• determine criterion that indicates failure of the seal system, the barrier fluid system, or both</li> </ul> </li> <li>• perform weekly visual inspections for indications of liquid dripping from the pump seals; monitor if indications observed to determine if there is a leak of HAP in the barrier fluid</li> </ul> <p><i>Applies as an alternative standard for:</i></p> <ul style="list-style-type: none"> <li>• Pumps in Light Liquid Service</li> <li>• Agitators in Gas/Vapor Service and in Light Liquid Service</li> </ul>
<b>Leak Definition</b>	Indications of liquids dripping from the pump seal and instrument reading of 1000 ppm HAP; failure of sensor criteria
<b>Alternative Standards</b>	N/A
<b>Exemptions</b>	<p>Any affected equipment equipped with a closed-vent system transporting fluid to process fuel gas system or control device</p> <p>Unsafe-to-monitor pumps are exempt if:</p> <ul style="list-style-type: none"> <li>• monitoring personnel would be exposed to an immediate danger</li> <li>• owner/operator has a written plan that requires monitoring as often as practical during safe to monitor times</li> </ul> <p>If at unmanned plant site, visually inspect as often as practical and at least monthly</p>
<b>Monitoring Method</b>	Visual, sensor
<b>Repair Requirements</b>	<p><i>First attempt within 5 calendar days of detection</i></p> <p>Repair as soon as practicable; no later than 15 days after leak is detected</p>

# DUAL MECHANICAL SEAL SYSTEM

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if repair requires replacing the existing seal design with a new system that meets improved performance criterion</p> <p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after leak has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number, and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or determined to be nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all dual mechanical seal systems:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of dual mechanical seal systems</li> <li>• location of equipment on site plan, log entries, etc.</li> <li>• documentation and dates of visual inspections</li> <li>• copies of periodic reports (if database not capable of generating)</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p>Identification, by list or location, of equipment in organic HAP service fewer than 300 hours per year</p>

## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial notification:</p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p>Notification of compliance status:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of pumps (excluding those in vacuum service)</li> <li>• method of compliance</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• the following information for each monitoring period in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of pumps for which leaks were detected</li> <li>•• percent of pumps leaking</li> <li>•• total number of pumps monitored</li> <li>•• number of pumps for which leaks were not repaired as required</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• revisions to items reported in the initial notification of compliance if method of compliance has changed since the last report</li> <li>• information listed under Notification of Compliance for process units with later compliance dates</li> </ul>

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Use cap, blind flange, plug, or second valve to seal open end at all times except when operations require flow through open end or during maintenance and repair</p> <p>Second valve: close valve on process fluid end prior to closing second valve</p> <p>Double block and bleed system: bleed line valve may remain open during venting operations that require venting the line between the block valves but comply with basic standard at all other times</p>
Leak Definition	N/A
Alternative Standards	Alternative means of emission limitation
Exemptions	<p>Emergency shutdown system</p> <p>Equipment containing materials which would automatically polymerize or cause a safety hazard if capped or equipped with a double block and bleed system</p> <p>Equipment in vacuum service</p> <p>Equipment operated fewer than 300 hours per year</p>
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all open-ended valves or lines:</p> <ul style="list-style-type: none"> <li>• list of ID number of subject equipment</li> <li>• location on site plan, log entries, etc.</li> </ul> <p>Copies of periodic reports (if database not capable of generating)</p> <p>Information and data used to demonstrate that equipment is not in organic HAP service or is in HAP service fewer than 300 hours/year</p>

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of compliance status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of open-ended valves or lines (excluding those in vacuum service)</li> <li>• method of compliance</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• dates of process unit shutdowns that occurred within the semiannual reporting period</li> <li>• revisions to items reported in the initial report if changes in the method of compliance have changed since the last report</li> <li>• information listed in notification of compliance status for process units with later compliance dates</li> </ul>

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p><i>Without rupture disk:</i></p> <ul style="list-style-type: none"> <li>• operate at less than 500 ppm above background except during pressure releases</li> <li>• within 5 calendar days after each release, return to operating standard and monitor the pressure relief device (PRD) to confirm</li> <li>• within 5 calendar days after the pressure release and being returned to HAP service, monitor to confirm 500 ppm above background standard</li> </ul> <p><i>With rupture disk:</i></p> <ul style="list-style-type: none"> <li>• after each release, replace rupture disk within 5 calendar days</li> </ul>
Leak Definition	< 500 ppm above background
Alternative Standards	Alternative means of emission limitation
Exemptions	<p><i>Pressure relief device routed to a process or fuel gas system or equipped with compliant closed-vent system and control device (see Closed-vent Systems and Control Devices)</i></p> <p><i>Pressure relief device in vacuum service</i></p> <p><i>Pressure relief device in organic HAP service fewer than 300 hours per year</i></p> <p><i>Any pressure relief device equipped with a rupture disk meeting the requirements of the rule</i></p>
Monitoring Method	<p>Method 21</p> <ul style="list-style-type: none"> <li>• Response factor criteria (excluding inerts) for average composition of process fluid</li> <li>• Monitor all equipment while it is "in service"</li> </ul>
Repair Requirements	<i>See basic standard</i>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p>

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after leak has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number, and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• dates of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or determined to be nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• <i>documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</i></li> <li>• copies of periodic reports (if database not capable of generating such)</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all pressure relief devices:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of pressure relief devices</li> <li>• list of ID numbers of pressure relief devices equipped with rupture disks</li> <li>• list of ID numbers of pressure relief devices complying with an instrument reading of less than 500 ppm above background standard</li> <li>• location of pressure relief devices on site plan, log entries, etc.</li> <li>• list of ID numbers for pressure relief devices equipped with closed-vent system and control device</li> <li>• documentation and dates of visual inspections</li> <li>• for monitoring following a pressure release for each PRD:                             <ul style="list-style-type: none"> <li>•• dates and results of monitoring</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> </ul> <p>Information and data used to demonstrate that a pressure relief device is not in organic HAP service or is in HAP service fewer than 300 hours/year</p>

# PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of Compliance Status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of pressure relief devices, excluding those in vacuum service</li> <li>• method of compliance</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• by monitoring period in the reporting period, explanation of why repairs delayed and why a process unit shutdown was infeasible</li> <li>• for "no detectable emissions" components, results of all monitoring to show compliance with the operating standard of less than 500 ppm</li> <li>• revisions to items reported in the initial report if changes have occurred since the initial report or subsequent revisions to the initial report</li> <li>• information listed in Notice of Compliance Status for process units with later compliance dates</li> </ul>



## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Monthly leak detection and repair</p> <p>Weekly visual observation for leaks</p> <p>For existing sources:</p> <ul style="list-style-type: none"> <li>• Phase I begins on compliance date</li> <li>• Phase II begins no later than 1 year after compliance date</li> <li>• Phase III begins no later than 2 ½ years after compliance date</li> </ul> <p>For new sources:</p> <ul style="list-style-type: none"> <li>• Phase II begins after initial start-up</li> <li>• Phase III begins no later than 1 year after initial start-up</li> </ul> <p>Choose no later than first monitoring period whether to calculate percent leaking pumps on a process unit basis or source-wide basis</p> <p>Phase III: if the greater of 10% or 3 pumps in a process unit leaks (6 month average), Quality Improvement Program (QIP) required</p>
Leak Definition	<p>Phase I: 10,000 ppm</p> <p>Phase II: 5,000 ppm</p> <p>Phase III: 5,000 ppm for pumps handling polymerizing monomers 2,000 ppm for pumps in food/medical service 1,000 ppm for all other pumps</p> <p>Indications of liquids dripping from pump seal</p>
Alternative Standards	<p>Alternative means of emission limitation</p> <p>Enclosed-vented process units: may enclose process units and operate under negative pressure while venting all leaks from equipment through a closed vent system to a control device meeting the requirements of this rule</p> <p>Batch processes: may pressure test or monitor equipment for leaks</p> <p>"No detectable emissions" pumps (see No Detectable Emissions)</p>

## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Exemptions	<p>Dual mechanical seal pumps (see Dual Mechanical Seal System)</p> <p>Pumps designed with no externally actuated shaft penetrating pump housing</p> <p>Pump equipped with closed-vent system and control device (see Closed-vent Systems and Control Devices)</p> <p>Pumps in vacuum service</p> <p>Pumps operated fewer than 300 hours per year in organic HAP service</p> <p><i>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</i></p> <p>If at unmanned site, visually inspect as often as practicable and at least monthly</p> <p>Unsafe to monitor pumps are exempt if:</p> <ul style="list-style-type: none"> <li>• monitoring personnel would be exposed to an immediate danger</li> <li>• owner/operator has a written plan that requires monitoring as often as practical during safe to monitor times, but not more frequently than the periodic monitoring schedule otherwise applicable</li> </ul>
Monitoring Method	<p>Method 21; no more than 1 cm from rotating shaft</p> <ul style="list-style-type: none"> <li>• <i>response factor criteria (excluding inerts) for average composition of process fluid</i></li> <li>• monitor all equipment while it is "in service"</li> </ul>
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p> <p>Phase III pumps with leak definition of 1,000 ppm: repair only required for pumps leaking at 2,000 ppm or more</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown.</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p> <p>Allowed if repair requires use of:</p> <ul style="list-style-type: none"> <li>• a new system determined to provide better performance under provisions of a QIP, or</li> <li>• a dual mechanical seal that includes a barrier fluid system, or</li> <li>• a pump designed with no externally actuated shaft, or</li> <li>• a closed-vent system and control device</li> </ul> <p><i>and repair is completed as soon as practicable but not later than 6 months after leak detected</i></p>

# PUMPS IN LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading (M21) after successful repair or determination the pump is nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all pumps:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject pumps</li> <li>• location of pump on site plan, log entries, etc.</li> <li>• list of ID numbers of pumps equipped with closed-vent system and control device</li> <li>• documentation and dates of visual inspections</li> <li>• copies of periodic reports (if database not capable of generating)</li> </ul> <p>Information to be kept for unsafe to monitor pumps:</p> <ul style="list-style-type: none"> <li>• identification of equipment designated as unsafe to monitor</li> <li>• plan for monitoring</li> </ul> <p>Information to be kept for difficult to monitor pumps:</p> <ul style="list-style-type: none"> <li>• list of ID numbers</li> <li>• explanation for designation</li> <li>• planned schedule for monitoring</li> </ul> <p>Information to be kept for pumps equipped with dual mechanical seal:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to the criteria, and reason for change</li> </ul> <p>Information and data used to demonstrate that a pump is not in organic HAP service, is in HAP service fewer than 300 hours/year, or is in heavy liquid service</p>

# PUMPS IN LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of compliance status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of pumps (excluding those in vacuum service)</li> <li>• method of compliance</li> <li>• planned schedule for each phase of requirements</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• the following information for each monitoring period in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of pumps for which leaks were detected</li> <li>•• percent of pumps leaking</li> <li>•• total number of pumps monitored</li> <li>•• number of pumps for which leaks were not repaired as required</li> <li>•• the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> </ul> </li> <li>• revisions to items reported in the initial notification of compliance status if method of compliance has changed since the last report</li> <li>• initiation of monthly monitoring under phase III or QIP (if applicable)</li> <li>• information listed under notification of compliance status for process units with later compliance dates</li> </ul>

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	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, unless repaired as discussed under "Repair Requirements" below
Leak Definition	<p>Monitoring:</p> <ul style="list-style-type: none"> <li>• agitators - 10,000 ppm</li> <li>• pumps - 2,000 ppm</li> <li>• valves, connectors, pressure relief devices, instrumentation systems - 500 ppm</li> <li>• pumps in food/medical service - 2,000 ppm</li> <li>• pumps handling polymerizing monomers - 5,000 ppm</li> </ul> <p>Other:</p> <ul style="list-style-type: none"> <li>• evidence of potential leak by visual, audible, olfactory or other detection requirement</li> </ul>
Alternative Standards	<p>Alternative means of emission limitation</p> <p>Enclosed vented process units: may enclose process units and operate under negative pressure while venting all leaks from equipment through a closed vent system to a control device meeting the requirements of this rule.</p> <p>Batch processes: may pressure test or monitor equipment for leaks</p>
Exemptions	<p>Equipment in vacuum service</p> <p>Equipment operated fewer than 300 hours per year in organic HAP service</p>
Monitoring Method	<p>Method 21; no more than 1 cm from rotating shaft</p> <ul style="list-style-type: none"> <li>• response factor criteria (excluding inerts) for average composition of process fluid</li> <li>• monitor all equipment while it is "in service"</li> </ul>
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p> <p>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</p>

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</p> <p>Valves, connectors and agitators:</p> <ul style="list-style-type: none"> <li>• Allowed if emissions of purged material resulting from immediate repair would exceed fugitive emissions from delay of repair and purged material is collected and destroyed or recovered in compliant control device when repair is done</li> </ul> <p>Valves:</p> <ul style="list-style-type: none"> <li>• Delay beyond a process unit shutdown allowed if sufficiently stocked supplies of valve assemblies have been depleted</li> <li>• Delay not allowed beyond the second process unit shutdown unless the third process unit shutdown occurs sooner than 6 months after first process unit shutdown</li> </ul> <p>Pumps:</p> <ul style="list-style-type: none"> <li>• Allowed if repair requires replacing existing seal design with a new system that provides better performance, dual mechanical seal system, meets requirements of §63.163(f), or compliant closed-vent system and control device, and repair is completed as soon as practicable but not later than 6 months after leak detected</li> </ul>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired, except valves</li> <li>• ID may be removed from valve after it has been monitored at least once within first 3 months of repair and no leak is detected</li> <li>• ID may be removed from connector after it has been repaired and monitored when reconnected or within 3 months of repair and no leak is detected</li> </ul> <p style="text-align: right;">(Continued on next page)</p>

**PUMPS, VALVES, CONNECTORS, AND AGITATORS  
IN HEAVY LIQUID SERVICE; INSTRUMENTATION SYSTEMS;  
AND PRESSURE RELIEF DEVICES IN LIQUID SERVICE**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements (continued)	<p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, and ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• maximum instrument reading after successful repair or determination the equipment is nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all equipment:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject equipment (except instrumentation systems)</li> <li>• location of equipment on site plan, log entries, etc.</li> <li>• documentation and dates of visual inspections</li> <li>• ID of instrumentation systems; individual components need not be identified</li> <li>• Information, data, and analysis used to demonstrate that a piece of equipment or process unit is in heavy liquid service</li> <li>• copies of periodic reports (if database not capable of generating)</li> </ul> <p>Additional information to be kept for connectors:</p> <ul style="list-style-type: none"> <li>• identification of connectors, by area or grouping, with total number of connectors within each group</li> <li>• ID of connectors opened or otherwise had the seal broken since the last monitoring period, and dates and results of follow-up monitoring</li> </ul>

PUMPS, VALVES, CONNECTORS, AND AGITATORS  
IN HEAVY LIQUID SERVICE; INSTRUMENTATION SYSTEMS;  
AND PRESSURE RELIEF DEVICES IN LIQUID SERVICE

APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial notification:</p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p>Notification of compliance status:</p> <ul style="list-style-type: none"> <li>• <i>process unit identification</i></li> <li>• number of each type of equipment (excluding those in vacuum service)</li> <li>• method of compliance</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• for each monitoring period, the facts that explain each delay of repair, and where appropriate, why a process unit shutdown was technically infeasible</li> <li>• revisions to items reported in the initial Notification of Compliance Status if method of compliance has changed since the last report</li> <li>• information listed in the Notification of Compliance Status for process units with later compliance dates</li> </ul>



# QUALITY IMPROVEMENT PROGRAM FOR PUMPS IN LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Applicability	<p>A technology review of improvement QIP's are required in Phase III if the greater of either 10% of pumps in a process unit (or plant site) or 3 pumps in a process unit (or plant site) leak</p> <p>Once &lt; 10% or &lt; 3 pumps leaking is achieved (6 month rolling average), comply with basic standard</p> <p>If leak rate again exceeds the greater of either &gt; 10% or 3 pumps leaking, can use QIP again</p>
Basic Standard	<p>Comply with basic standard for pumps not in QIP</p> <p>Collect the following data:</p> <p>Pumps:</p> <ul style="list-style-type: none"> <li>• type and manufacturer</li> <li>• seal type and manufacturer</li> <li>• pump design</li> <li>• materials of construction</li> <li>• year installed</li> <li>• barrier fluid or packing material</li> </ul> <p>Service characteristics of the stream:</p> <ul style="list-style-type: none"> <li>• discharge pressure, temperature, flow rate, corrosivity, annual operating hours</li> </ul> <p>Maximum instrument readings before repair, response factor for stream, instrument number, and date of observation</p> <p>If leak is detected, repair methods used and the instrument readings after the repair</p> <p>Inspect all pumps and pump seals that exhibit frequent failure and were removed from the process unit due to leaks; determine probable cause of leaks and recommend changes to reduce leak potential.</p> <p>Continue to collect data as long as part of QIP</p>
Data Analysis	<p>Analyze data to determine the services, operating and maintenance procedures, and pumps and pump seal designs or technologies that have poorer and those that have better than average 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, and shall be done yearly for as long as the process unit is in the QIP program. The analysis shall determine if specific trouble areas can be identified.</p>

# QUALITY IMPROVEMENT PROGRAM FOR PUMPS IN LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Performance Trial Evaluation	<p>Required for plants that have not demonstrated superior technologies:</p> <ul style="list-style-type: none"> <li>• the number of pump seal technologies or pumps in the trial program shall be the lesser of 1% or 2 pumps for programs involving single process units and the lesser of 1% 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</li> <li>• the program shall specify and include design documentation, the evaluation stages, frequency of monitoring, the range of operating conditions, and conclusions</li> </ul> <p>The performance trials shall be conducted for a 6-month period beginning no later than 18 months after the beginning of the QIP</p> <p>Conclusions will be drawn no later than 24 months after the beginning of the QIP</p> <p>Any plant site with fewer than 400 valves and owned by a company with fewer than 100 employees exempt from trial evaluations. Instead begin pump seal or pump replacement program at the start of the fourth year of QIP.</p>
Performance Test Evaluation Termination	<p>Continue to conduct trials as long as no superior performing design or technology has been identified or until there are no technically feasible alternatives as demonstrated through an engineering evaluation. Otherwise the facility may stop conducting performance tests after all alternative superior emission performance technologies have been evaluated and a superior performing design or technology has been demonstrated</p>
Quality Assurance Program	<p>Establishes minimum design standards for each category of pumps or pump seal technology</p> <p>Requires that all equipment orders specify the design standard for the pump or pump seal</p> <p>Provides for an audit procedure for quality control of purchased equipment</p> <p>Details off-line pump maintenance and repair procedures</p> <p>Shall be established no later than start of third year of QIP for sites with ≥400 valves or ≥100 employees; by start of fourth year for others</p>
Equipment Replacement	<p>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 emission performance technology with pumps or pump seals of superior technology that comply with QA standards for the pump category.</p> <p>Pumps or pump seals shall be replaced at the rate of 20% per year based on the total number of pumps in light liquid service (minimum of one) and shall continue to be replaced until all are superior technology</p>

# QUALITY IMPROVEMENT PROGRAM FOR PUMPS IN LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Superior Emission Performance Technology	<p>Category or design of pumps or pump seals that will result in &lt;10% leaking pumps in the process unit of plant site</p> <p>Includes material or design changes to the existing pump, pump seal, seal support system, installation of multiple mechanical seals or equivalent, or pump replacement</p>
Recordkeeping Requirements	<ul style="list-style-type: none"> <li>• pump type, manufacturer, seal type and manufacturer, design, materials of construction (if applicable), barrier fluid or packing material, and year installed</li> <li>• service characteristics of the stream, discharge pressure, temperature, flow rate, corrosivity, and annual operating hours</li> <li>• maximum instrument readings before repair, response factor, instrument number, and date of observation</li> <li>• if leak detected, the repair method used and the instrument reading after repair</li> <li>• if data analyzed as part of a larger analysis program; describe any maintenance or QIP intended to improve emission performance</li> <li>• rolling average percent leaking pumps</li> <li>• documentation of all inspections and recommendations for design or specification changes to reduce leak frequency</li> <li>• beginning and end dates while meeting requirements of the QIP</li> <li>• reason for any leak repair delay and expected date of successful repair</li> <li>• records of all analyses required under §63.176(d), including:                         <ul style="list-style-type: none"> <li>•• list identifying areas associated with poorer than average performance and associated service characteristics of the stream, operating conditions, and maintenance procedures</li> <li>•• reasons for rejecting specific candidate superior emission performing pump technology from performance trials</li> <li>•• list of candidate superior emission performing pump technologies and documentation of <i>performance trial program items required under 63.176(d)(6)(iii)</i></li> <li>•• beginning date and duration of performance trials for each candidate superior emission performing technology</li> </ul> </li> <li>• records documenting the quality assurance program, as specified in 63.176(d)(7)</li> <li>• records indicating all pumps replaced or modified are in compliance with the quality assurance program</li> <li>• records documenting compliance with 20% or greater annual replacement rate for pumps</li> <li>• information and data showing company has fewer than 100 employees</li> </ul>
Reporting Requirements	<p>Semiannual reports:</p> <ul style="list-style-type: none"> <li>• initiation of monthly monitoring under Phase III or QIP (if applicable)</li> </ul>

# QUALITY IMPROVEMENT PROGRAM FOR VALVES

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Applicability	<p><i>Optional in Phase III to owners/operations with ≤ 2% leakers</i></p> <p>Decision required within first year of Phase III</p> <p>If rolling average of percent leakers is &lt; 2% for 2 consecutive quarters: 1) comply with QIP, 2) comply with valve standard, or 3) comply with both QIP and valve standard</p> <p>If continuing QIP, exempt from performance trial requirements or further progress as long as process unit has &lt; 2% leaking valves</p> <p><i>If not continuing QIP (i.e., complying with valve standard) cannot use QIP again if leak rate goes above 2%; monthly monitoring is required</i></p> <p>If complying with both QIP and valve standard, owner/operator may use the following monitoring frequencies:</p> <ul style="list-style-type: none"> <li>• if &lt; 2% leaking, then monitor once per quarter</li> <li>• if &lt; 1% leaking, then monitor once every 2 quarters</li> <li>• if &lt; 0.5% leaking, then once every 4 quarters</li> </ul>
Demonstration of Further Progress	<p>Comply with valve standard except monitor quarterly</p> <p>Collect data and maintain records as follows:</p> <ul style="list-style-type: none"> <li>• maximum instrument reading observed in each monitoring, response factor, model number, and date of observation</li> <li>• classification of valve "gas or light liquid service"</li> <li>• 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)</li> </ul> <p>Continue to collect data for as long as the process unit is in QIP</p> <p>Demonstrate progress in reducing the percent leaking valves each quarter by at least:</p> <ul style="list-style-type: none"> <li>• 10 percent (meaning that each quarter there is at least a 10 percent reduction in the percent leaking valves from the preceding monitoring period) or</li> <li>• determine required quarterly percent reduction and to less than 2% within 2 years</li> </ul> <p>The provisions for failure to meet the 10% reduction for 2 consecutive rolling averages are:</p> <ul style="list-style-type: none"> <li>• a choice of monthly monitoring, or</li> <li>• implementation of a QIP for technology review as specified in §63.175(e)</li> </ul>

# QUALITY IMPROVEMENT PROGRAM FOR VALVES

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Data Collection (Technology Review and Improvement)	<p>Data collection for as long as in QIP:</p> <ul style="list-style-type: none"> <li>• valve type and manufacturer, valve design, materials of construction, year installed, and packing material</li> <li>• service characteristics of the stream (e.g., operating pressure, temperature, line diameter, corrosivity)</li> <li>• gas/vapor or light liquid service</li> <li>• repair methods used and the instrument readings after the repair</li> <li>• maximum instrument reading before repair, response factor, model number, and date of observation</li> <li>• description of use of any maintenance or quality assurance programs intended to improve emissions</li> </ul> <p>Inspect all valves removed due to leaks to determine cause of failure and recommend design and other changes to reduce leak potential</p>
Data Analysis (Technology Review and Improvement)	Analyze data to determine the services, operating and maintenance procedures, and valve designs or technologies that have poorer and those that have better than average performance to determine specific trouble areas; 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
Definition of Superior Performing Valve Technology	<p>Technology for valves having a leak frequency of &lt;2% for specific applications in process unit</p> <p>Candidate demonstrates or reports having low emission performance and capable of achieving &lt;2% leaking valves in process unit</p>
Performance Test Trial Evaluation (Technology Review and Improvement)	<p>Required for plants that have not demonstrated superior technologies:</p> <ul style="list-style-type: none"> <li>• the number of valves in the trial program shall be the lesser of 1% or 20 valves for programs involving single process units and the lesser of 1% or 50 valves for programs involving groups of process units</li> <li>• the program shall specify and include design documentation, the evaluation stages, frequency of monitoring, the range of operating conditions, and conclusions regarding performance and operating conditions and services</li> </ul> <p>Any plant site with fewer than 400 valves and owned by a company with fewer than 100 employees exempt from trial evaluations. Instead begin program at the start of the fourth year of Phase III</p> <p>The performance trials shall be conducted for a 6-month period beginning no later than 18 months after the beginning of the QIP</p> <p>Conclusions will be drawn no later than 24 months after the beginning of the QIP</p> <p>Performance test trials will continue as long as no superior design or technology is identified</p>

# QUALITY IMPROVEMENT PROGRAM FOR VALVES

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Quality Assurance Plan	<p>Program shall be established no later than the start of the third year of Phase III for plant sites with <math>\geq 400</math> valves or <math>\geq 100</math> employees, and no later than the start of the fourth year of Phase III for plants with <math>&lt; 400</math> valves and <math>&lt; 100</math> employees</p> <p>Program shall be reviewed and updated (as appropriate) each year as long as the process unit has <math>\geq 2\%</math> leaking valves</p> <p>Program shall:</p> <ul style="list-style-type: none"> <li>• Establish minimum design standards for each category of valves</li> <li>• Require that all equipment orders specify the design standard</li> <li>• Include a written procedure for bench testing</li> <li>• Require that all valves repaired on-line be monitored for 2 successive months after repair</li> <li>• Provide for an audit procedure for quality control of purchased equipment</li> <li>• Detail off-line valve maintenance and repair procedures</li> </ul>
Equipment Replacement (Technology Review and Improvement)	<p>Beginning at the start of the third year of Phase III for plants with 400 or more valves or 100 or more employees and at the start of the fourth year of Phase III for others, each replacement valve shall meet quality assurance and superior emission performance technology standards</p> <p>If superior emission performance technology cannot be identified, replacement valve shall be one with lowest emission performance technologies identified for the specific application</p>
Recordkeeping Requirements	<p>QIP:</p> <ul style="list-style-type: none"> <li>• reason for any leak repair delay and expected date of successful repair</li> <li>• records of all analyses required under §63.175(e)</li> <li>• records documenting the quality assurance program</li> <li>• records indicating all valves replaced or modified are in compliance with the quality assurance requirements</li> <li>• information and data showing company has fewer than 100 employees</li> </ul>
Recordkeeping for QIP- Demonstration of Reasonable Further Progress	<p>QIP - reasonable further progress:</p> <ul style="list-style-type: none"> <li>• owner or operator shall collect the following data and maintain records for each valve in each process unit subject to the QIP                             <ul style="list-style-type: none"> <li>•• maximum instrument reading before repair, response factor, instrument model number, and date of observation</li> <li>•• whether valve is in gas or light liquid service</li> <li>•• if leak detected, the repair methods used and instrument reading after repair</li> </ul> </li> <li>• percent leaking valves and rolling average percent reduction observed each quarter</li> <li>• beginning and end dates while meeting the requirements of the QIP</li> </ul>

## QUALITY IMPROVEMENT PROGRAM FOR VALVES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping for QIP - Technology Review and Improvement	<p>QIP - technology review and improvement:</p> <ul style="list-style-type: none"> <li>• valve type, manufacturer, design, materials of construction, packing material, and year installed</li> <li>• service characteristics of the stream (e.g. operating pressure, temperature, line diameter, corrosivity)</li> <li>• <i>whether valve is in gas/vapor or light liquid service</i></li> <li>• if leak detected, maximum instrument reading before repair, response factor, model number, and date of observation</li> <li>• if leak detected, the repair method used and the instrument reading after repair</li> <li>• if data analyzed as part of a larger analysis program; describe any maintenance or QIP intended to improve emission performance</li> <li>• percent leaking valves observed each quarter</li> <li>• documentation of all inspections and recommendations for design or specification changes to reduce leak frequency</li> <li>• beginning and end dates while meeting requirements of the QIP of technology review and improvement</li> </ul>
Reporting Requirements	<p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• initiation of monthly monitoring under Phase III or QIP (if applicable)</li> </ul>

## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Equipped with closed-purge system or closed-vent system that returns the fluid to the process line; recycles the purged fluid; sends it to a compliant control device; or collects, stores and transports it to an appropriate facility</p> <p>Gases displaced during filling of samples are not required to be collected or captured</p>
Leak Definition	N/A
Alternative Standards	Alternative means of emission limitation
Exemptions	<p>Sampling systems in vacuum service</p> <p>In-situ sampling systems and sampling systems without purges</p> <p>Sampling systems in organic HAP service fewer than 300 hours per year</p>
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all sampling connections</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject sampling connection systems</li> <li>• location of sampling system on site plan, log entries, etc.</li> </ul> <p>Information and data used to demonstrate that equipment is not in organic HAP service or is in HAP service fewer than 300 hours/year.</p>



## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of Compliance Status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of sampling connection systems, excluding those in vacuum service</li> <li>• method of compliance</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• for each monitoring period during the 6 month period, the facts that explain any delay of repairs and, where appropriate, why a process unit shutdown was infeasible</li> <li>• revisions to items reported in the initial notification of compliance status if the method of compliance has changed since the last report</li> <li>• information listed under Notice of Compliance Status for process units with later compliance dates</li> </ul>

## SURGE CONTROL VESSELS AND BOTTOM RECEIVERS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Use of closed-vent system that routes the organic vapors either back to process or to compliant control device</p> <p>Comply with the requirements under §63.119(b) for fixed roofs with internal floating roofs or under §63.119(c) for external floating roofs</p>
Leak Definition	N/A
Alternative Standards	Alternative means of emission limitation
Exemptions	<p>Equipment in vacuum service</p> <p>Equipment in organic HAP service fewer than 300 hours per year</p> <p>Surge control vessels routed back to process</p> <p>Surge control vessels that do not meet certain capacity and vapor pressure criteria; see Tables 2 and 3 of Subpart H</p>
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept for all equipment:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject equipment</li> <li>• location of equipment on site plan, log entries, etc.</li> <li>• ID of surge control vessels or bottoms receivers equipped with a closed vent system or control device</li> </ul> <p>Information and data used to demonstrate that equipment is not in organic HAP service or is in HAP service fewer than 300 hours/year</p>

## SURGE CONTROL VESSELS AND BOTTOM RECEIVERS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Initial notification:</p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p>Notification of Compliance Status:</p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of each type of equipment, excluding those in vacuum service</li> <li>• method of compliance</li> </ul> <p>Subsequent semiannual reports:</p> <ul style="list-style-type: none"> <li>• revisions to items reported in the Notification of Compliance Status if the method of compliance has changed since the last report</li> <li>• Information listed in the Notice of Compliance Status for process units with later compliance dates</li> </ul>

## VALVES IN GAS VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS										
Basic Standard	<p>Phase I &amp; II: Monitor each valve quarterly</p> <p>Phase III: <i>Monitoring frequency based on percent valves found leaking:</i></p> <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>Percent Leaking</u></td> <td style="text-align: center;"><u>Monitoring Frequency</u></td> </tr> <tr> <td style="text-align: center;">2% (or more)</td> <td style="text-align: center;">Monthly or QIP</td> </tr> <tr> <td style="text-align: center;">&lt;2%</td> <td style="text-align: center;">Quarterly</td> </tr> <tr> <td style="text-align: center;">&lt;1%</td> <td style="text-align: center;">Quarterly or once every 2 quarters</td> </tr> <tr> <td style="text-align: center;">&lt;0.5%</td> <td style="text-align: center;">Quarterly or once every 4 quarters</td> </tr> </table> <p>For existing sources:</p> <ul style="list-style-type: none"> <li>• Phase I begins on compliance date</li> <li>• Phase II begins no later than 1 year after compliance date</li> <li>• Phase III begins no later than 2 ½ years after compliance date</li> </ul> <p>For new sources:</p> <ul style="list-style-type: none"> <li>• Phase II begins after initial start-up</li> <li>• Phase III begins no later than 1 year after initial start-up</li> </ul>	<u>Percent Leaking</u>	<u>Monitoring Frequency</u>	2% (or more)	Monthly or QIP	<2%	Quarterly	<1%	Quarterly or once every 2 quarters	<0.5%	Quarterly or once every 4 quarters
<u>Percent Leaking</u>	<u>Monitoring Frequency</u>										
2% (or more)	Monthly or QIP										
<2%	Quarterly										
<1%	Quarterly or once every 2 quarters										
<0.5%	Quarterly or once every 4 quarters										
Leak Definition	<p>Phase I: 10,000 ppm</p> <p>Phase II: 500 ppm</p> <p>Phase III: 500 ppm</p>										
Alternative Standards	<p>Alternative means of emission limitation</p> <p>QIP for valves (Phase III)</p>										
Exemptions	<p>Valves in vacuum service</p> <p>Valves in organic HAP service fewer than 300 hours per year</p> <p>Valves designated unsafe to monitor or difficult to monitor (at new facilities, maximum 3% of valves may be designated as difficult to monitor)</p> <p>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 &lt;1% or 0.5%, as applicable</p>										
Monitoring Method	<p>Method 21</p> <ul style="list-style-type: none"> <li>• response factor criteria (excluding inerts) for average composition of process fluid</li> <li>• monitor all equipment while it is "in service"</li> </ul>										

## VALVES IN GAS VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p> <p>When repaired, monitor at least once within first 3 months of repair</p>
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p><i>Allowed for equipment that is isolated from the process and that does not remain in organic HAP service</i></p> <p>Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a control device when repair occurs</p> <p>Allowed beyond process unit shutdown if valve assembly replacement supplies are exhausted and had been sufficiently stocked before supplies were depleted</p> <p>Not allowed beyond second process unit shutdown unless third shutdown occurs sooner than 6 months after first shutdown</p>

# VALVES IN GAS VAPOR AND LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired and monitored at least once within first 3 months of repair and no leak is detected</li> </ul> <p>Information to be kept in log for 2 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and equipment ID number and operator name, initials, or ID number</li> <li>• date leak detected</li> <li>• date of first attempt to repair leak</li> <li>• maximum instrument reading after successful repair or if determined to be nonrepairable</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection. The owner or operator may develop and cite a written procedure that identifies conditions justifying a delay of repair</li> <li>• documentation of sufficient supply of spare parts on-site before depletion and reason for depletion if repair delayed because stocked parts were depleted</li> <li>• dates of process unit shutdown that occurred while the equipment is unrepaired</li> <li>• date of successful repair of the leak</li> <li>• copies of periodic reports (if database not capable of generating)</li> </ul> <p>Information to be kept for all valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of subject valves</li> <li>• location of valve on-site plan, log entries, etc.</li> <li>• schedule by process unit for monitoring valves</li> <li>• list of valves removed and added to a process unit after the compliance date if net credits for their removal are expected to be used</li> </ul> <p>Information to be kept for difficult to monitor valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers</li> <li>• explanation for designation</li> <li>• planned schedule for monitoring</li> </ul> <p>Information to be kept for unsafe to monitor valves:</p> <ul style="list-style-type: none"> <li>• identification of equipment designated as unsafe to monitor</li> <li>• plan for monitoring</li> </ul> <p>Information and data used to demonstrate that a valve is not in organic HAP service, is in HAP service fewer than 300 hours/year, or is in heavy liquid service</p>

## VALVES IN GAS VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p><b>Initial notification:</b></p> <ul style="list-style-type: none"> <li>• name and address of owner/operator</li> <li>• address of facility</li> <li>• identification of subject processes</li> <li>• compliance statement</li> <li>• statement if a source can achieve compliance by applicable date</li> </ul> <p><b>Notification of Compliance Status:</b></p> <ul style="list-style-type: none"> <li>• process unit identification</li> <li>• number of valves, excluding those in vacuum service</li> <li>• method of compliance</li> <li>• planned schedule for each phase</li> </ul> <p><b>Subsequent semiannual reports:</b></p> <ul style="list-style-type: none"> <li>• the following information for each monitoring period in the reporting period:                             <ul style="list-style-type: none"> <li>•• number of valves for which leaks were detected</li> <li>•• total number of valves monitored</li> <li>•• the percent leakers for valves</li> <li>•• number of valves for which leaks were not repaired within 15 days after detection</li> <li>•• identification of the number of valves determined to be nonrepairable</li> <li>•• explanation of why repairs delayed and why a process unit shutdown was infeasible</li> </ul> </li> <li>• revisions to items reported in the initial compliance notice if the method of compliance has changed since the last report</li> <li>• initiation of monthly monitoring under Phase III or QIP (if applicable)</li> <li>• information listed in the Notice of Compliance Status for process units with later compliance dates</li> </ul>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Control devices and closed-vent systems to be operated at all times that emissions may be vented to them</p> <p>Each piece of equipment shall be marked in such a manner to distinguish it readily from other pieces of equipment</p> <p>Applies to equipment containing or contacting hazardous waste with minimum organic concentrations of 10% by weight</p> <p><b>Control Devices:</b></p> <ul style="list-style-type: none"> <li>• vapor recovery systems: 95 percent by weight 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</li> <li>• carbon adsorbers: carbon replacement intervals specified</li> <li>• enclosed combustion devices (e.g., vapor incinerator, boiler, or process heater): 95 percent or greater reduction, 20 ppmv total organic compound concentration, or minimum residence time of 0.50 seconds at a minimum temperature of 760 °C; boilers and process heaters: introduce vent stream into flame combustion zone</li> <li>• flares: <i>basic requirements for visible emissions, heat content, exit velocities, and flare design; flame present at all times</i></li> </ul> <p><b>Closed-Vent Systems:</b></p> <ul style="list-style-type: none"> <li>• designed to operate with no detectable emissions, indicated by instrument reading of less than 500 ppmv above background and by visual inspections; or</li> <li>• designed to operate at a pressure below atmospheric pressure</li> </ul> <p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>• <b>Control devices:</b> <ul style="list-style-type: none"> <li>•• monitor to ensure operated and maintained in conformance with their designs</li> <li>•• <i>specific requirements identified for vent stream flow monitors and other monitors for specific types of control devices</i></li> </ul> </li> <li>• <b>Closed-vent systems:</b> <ul style="list-style-type: none"> <li>•• initial leak detection monitoring to demonstrate that closed-vent system operates with no detectable emissions (&lt;500 ppmv above background)</li> <li>•• initial inspection to be performed on or before the system is subject to regulation</li> <li>•• closed-vent system joints, seams or other connections that are permanently or semi-permanently sealed shall be visually inspected at least once per year</li> <li>•• components shall be monitored after repair or replacement or after connection is unsealed</li> <li>•• closed-vent system components or connections (except those designated unsafe to monitor) shall be monitored annually and at other times as requested by the Regional Administrator</li> </ul> </li> </ul>
Leak Definition	No detectable emissions (< 500 ppm above background)
Alternative Standards	N/A



## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Exemptions	<p>Equipment which contains or contacts a hazardous waste of at least 10% by weight for a period of fewer than 300 hours per year</p> <p>Any components of a closed-vent system designated as unsafe to monitor are exempt from annual monitoring if:</p> <ul style="list-style-type: none"> <li>• monitoring personnel would be exposed to an immediate danger, and</li> <li>• the owner or operator adheres to a written plan that requires monitoring as frequently as practicable during safe to monitor times</li> </ul>
Monitoring Method	<p>Method 21 (closed-vent systems)</p> <p>Specified monitoring procedures for control devices</p>
Repair Requirements	<p>First attempt to repair within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>
Delay of Repair	<p><i>Allowed if technically infeasible without process unit shutdown or if emissions from immediate repair would be greater than fugitive emissions from delay of repair; required before end of next process unit shutdown</i></p> <p>Allowed for equipment that is isolated from the process and that does not remain in contact with organic hazardous waste at least 10% by weight</p>
Recordkeeping Requirements	<p>Information to be kept for each closed vent system and control device: (information to be maintained in facility's operating record)</p> <ul style="list-style-type: none"> <li>• equipment ID and hazardous waste management unit ID</li> <li>• approximate location within facility on facility plot plan</li> <li>• type of equipment</li> <li>• percent by weight total organics in hazardous waste stream</li> <li>• hazardous waste state at the closed-vent system and control device</li> <li>• method of compliance with the standard</li> <li>• implementation schedule for installation and operation of closed-vent system and control device if unable to install and comply by the effective date of the rule</li> <li>• performance test plan if using test data to demonstrate the organic removal efficiency or total organic compound concentration achieved by the closed-vent system and control device including:                             <ul style="list-style-type: none"> <li>•• description of how the test will be conducted when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur, including estimated or design flow rate and organic content of each vent stream and definition of acceptable operating ranges of key process and control parameters during the test program</li> </ul> </li> </ul> <p style="text-align: center;">(Continued on next page)</p>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements (continued)	<ul style="list-style-type: none"> <li>•• a detailed engineering description of the closed-vent system and control device including:                             <ul style="list-style-type: none"> <li>••• manufacturers name and model number</li> <li>••• type of control device</li> <li>••• dimensions of control device</li> <li>••• capacity</li> <li>••• construction materials</li> </ul> </li> <li>•• a detailed description of sampling and monitoring procedures, including location in the system, equipment used, sampling and monitoring frequency and planned analytical procedures</li> <li>• documentation of compliance with standard including detailed design documentation or performance test results specified in 264.1035(b)(4) and 265.1035(b)(4)</li> <li>• design documentation and operating, monitoring, and inspection information for each closed vent system and control device as specified in 264.1035(c) and 265.1035(c); maintain for 3 years</li> <li>• for control devices other than thermal vapor incinerators, catalytic vapor incinerators, flares, boilers, process heaters, condensers, or carbon adsorption systems, monitoring and inspection information indicating proper operation and maintenance</li> <li>• list of ID numbers for the closed vent systems and control devices</li> <li>• list of ID numbers for equipment in vacuum service</li> <li>• identification, by list or location, of equipment that contains or contacts hazardous waste with an organic concentration of at least 10% by weight for a period of less than 300 hours/year</li> </ul> <p>Information to be kept for the purpose of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up-to-date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not be subject</li> </ul> <p>Information to be kept for unsafe to monitor closed-vent system and control device:</p> <ul style="list-style-type: none"> <li>• identification of equipment designated as unsafe to monitor</li> <li>• explanation stating why the closed-vent system is unsafe to monitor</li> <li>• plan for monitoring</li> </ul> <p>In addition:</p> <ul style="list-style-type: none"> <li>• Part 264 - for "other" control devices - monitoring and inspection criteria indicating proper operation and maintenance of the control device will be determined by the Regional Administrator</li> </ul>

## CLOSED-VENT SYSTEMS AND CONTROL DEVICES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:                             <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*                             <ul style="list-style-type: none"> <li>•• the EPA ID number, name and address of the facility</li> <li>•• dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period</li> <li>•• for each month during the semiannual reporting period, if any control device exceeded or operated outside design specifications and was not corrected within 24 hours, report the duration and cause of each exceedance, and any corrective measures taken</li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required.</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Equip with compliant seal system that includes a barrier fluid system that prevents leakage to atmosphere</p> <p>For each barrier fluid system:</p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• connect the barrier fluid degassing reservoir by a closed-vent system to a compliant control device, or</li> <li>• equip with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to the atmosphere (less than 500 ppm above background)</li> </ul> <p>The barrier fluid system must not be a hazardous waste with organic concentrations 10% or greater by weight</p> <p>Install sensor to detect failure of seal system, barrier fluid system, or both</p> <p>Check sensor daily or equip with audible alarm that is checked monthly; if at unmanned plant site, check sensor daily</p> <p>Establish criteria that indicates failure of seal system, barrier fluid system, or both</p>
Leak Definition	Sensor indicates failure of seal system, barrier fluid system, or both based on established criteria
Alternative Standards	N/A
Exemptions	<p>Equipment designated for no detectable emissions (less than 500 ppm above background) (see No Detectable Emissions)</p> <p>Equipment in vacuum service</p> <p>Equipment equipped with closed vent system and control device capable of capturing and transporting leakage from the seal to a compliant control device (see Closed-vent Systems and Control Devices)</p>
Monitoring Method	<p>Observation of sensor</p> <p>Method 21 for no detectable emissions</p>
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 calendar days after detection</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if technically infeasible without hazardous waste management unit shutdown; required before end of next waste management unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in contact with organic hazardous waste at least 10% by weight</p>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number and date leak was detected, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 3 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all compressors:</p> <ul style="list-style-type: none"> <li>• compressor ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the compressor</li> <li>• hazardous waste state at the compressor</li> <li>• method of compliance</li> <li>• list of ID numbers of subject compressors</li> <li>• list of ID numbers of compressors designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for compressors designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for compressors in vacuum service</li> <li>• identification, by list or location, of 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</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p style="text-align: right;">(Continued on next page)</p>

# COMPRESSORS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements, continued	<p>Information to be kept for the purpose of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up-to-date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:               <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*               <ul style="list-style-type: none"> <li>•• the EPA ID number, name and address of the facility</li> <li>•• for each month during the semiannual reporting period:                   <ul style="list-style-type: none"> <li>••• the ID number for each compressor for which a leak was not repaired as required</li> <li>••• if control device for any compressor exceeded or operated outside of design specification and was not corrected within 24 hours, report the duration and cause of each exceedance, and any correction measures taken.</li> </ul> </li> <li>•• dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period</li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required</p>

## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>For each dual mechanical seal system that includes a barrier fluid system:</p> <ul style="list-style-type: none"> <li>• operate the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or</li> <li>• connect the barrier fluid degassing reservoir by a closed-vent system to a compliant control device, or</li> <li>• equip with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to the atmosphere (less than 500 ppm above background)</li> </ul> <p>The barrier fluid system must not be a hazardous waste with organic concentrations 10% or greater by weight</p> <p>Equip each barrier fluid system with a sensor that detects failure of the seal system, barrier fluid system, or both</p> <ul style="list-style-type: none"> <li>• check each sensor daily or equip with audible alarm; check audible alarm monthly to ensure it is working</li> </ul> <p>Visually inspect weekly for indications of liquids dripping from the pump seals</p> <p>Establish criteria, based on design and operating experience, that indicates failure of the seal system, barrier fluid, or both</p> <p>Applies as an alternative to pumps in light liquid service</p>
Leak Definition	Indications of liquids dripping from the pump seal or sensor detection, based on failure criteria
Alternative Standards	N/A
Exemptions	<p><i>Designated for no detectable emissions (less than 500 ppm above background) and if no externally actuated shaft penetrates pump housing and pump is tested for compliance initially, annually, and at other times requested by Administrator (see No Detectable Emissions)</i></p> <p><i>Equipped with closed-vent system capable of capturing and transporting leakage from the seal(s) to a compliant control device (see Closed-vent Systems and Control Devices)</i></p>
Monitoring Method	Visual, sensor, criteria
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>

# DUAL MECHANICAL SEAL SYSTEM

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>If repair requires use of a dual mechanical seal that includes a barrier fluid system and repair is completed as soon as practicable but no later than 6 months after leak detected</p> <p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p><i>Allowed for equipment that is isolated from the process and that does not remain in VOC service</i></p>
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number and date leak was detected, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in inspection log for 3 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument ID; operator name, initials, or ID number; and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a <i>hazardous waste management shutdown</i></li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all dual mechanical seal systems:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of dual mechanical seal systems</li> <li>• list of ID numbers designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for components designated for no detectable emissions:               <ul style="list-style-type: none"> <li>•• dates conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers of mechanical seal systems in vacuum service</li> <li>• equipment ID number and hazardous waste management unit ID</li> <li>• approximate facility location on facility plot</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the equipment</li> <li>• hazardous waste state at the equipment</li> <li>• method of compliance</li> <li>• identification, by list or location, of 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</li> </ul> <p>Information to be kept for barrier fluid and seal systems:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to criteria and reasons for change</li> </ul> <p style="text-align: right;">(Continued on next page)</p>



## DUAL MECHANICAL SEAL SYSTEM

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements, continued	<p>Information to be kept for the purpose of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up-to-date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:                             <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*                             <ul style="list-style-type: none"> <li>•• the EPA ID number, name, and address of the facility</li> <li>•• by month in the reporting period, dates of hazardous waste management unit shutdowns that occurred</li> <li>•• ID number for any pump not repaired on time</li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps and compressors are repaired as required and the control device does not exceed or operate outside of the design specifications for more than 24 hours, no report to the Regional Administrator is required.</p>

# NO DETECTABLE EMISSIONS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Has an instrument reading of less than 500 ppm above background as measured by the methods specified in 264.1063(c) and 265.1063(c)</p> <p>Test for compliance initially upon designation, annually, and as requested by the Regional Administrator</p> <p>Applies as an exemption to:</p> <ul style="list-style-type: none"> <li>• pumps (must have no externally actuated shaft penetrating the pump housing)</li> <li>• valves in gas/vapor service or in light liquid service (must have no external actuating mechanism in contact with the hazardous waste stream)</li> <li>• compressors</li> </ul> <p>Applies as basic standard for:</p> <ul style="list-style-type: none"> <li>• closed-vent systems</li> <li>• pressure relief devices in gas/vapor service</li> </ul>
Leak Definition	< 500 ppm above background
Alternative Standards	N/A
Exemptions	N/A
Monitoring Method	Method 21
Repair Requirements	N/A
Delay of Repair	N/A
Recordkeeping Requirements	<p>Information to be kept:</p> <ul style="list-style-type: none"> <li>• list of ID numbers of equipment designated for no detectable emission and signed by owner/operator</li> <li>• for each compliance test for no detectable emissions:               <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> </ul>

# NO DETECTABLE EMISSIONS

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	Semiannual report requirements: <ul style="list-style-type: none"> <li>• Part 265:                             <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:                             <ul style="list-style-type: none"> <li>•• None specific to no detectable emissions</li> </ul> </li> </ul>

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Use cap, blind flange, plug, or second valve to seal open end at all times except when operations require flow through open end</p> <p>Second valve: close valve on process fluid end prior to closing second valve</p> <p>Double block and bleed system: bleed lines may remain open during operations that require venting the line between the block valves but comply with basic standard at all other times</p>
Leak Definition	N/A
Alternative Standards	N/A
Exemptions	Equipment in vacuum service
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A

## OPEN-ENDED VALVES OR LINES

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>Information to be kept for all open-ended valves or lines:</p> <ul style="list-style-type: none"> <li>• equipment ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the valve</li> <li>• hazardous waste state at the valve</li> <li>• method of compliance</li> <li>• list of ID numbers of subject valves and lines</li> <li>• list of ID numbers of equipment in vacuum service</li> <li>• <i>identification either by list or location of 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</i></li> </ul> <p>Information to be kept for the purpose of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up-to-date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265: <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264: <ul style="list-style-type: none"> <li>•• None specific to open-ended valves or lines</li> </ul> </li> </ul>

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>No detectable emissions (less than 500 ppm above background)</p> <p>After each release return to no detectable emissions within 5 calendar days as indicated by monitoring of the pressure relief device</p>
Leak Definition	No detectable emissions (< 500 ppm above background)
Alternative Standards	N/A
Exemptions	<p>Pressure relief devices in vacuum service</p> <p>Pressure relief device equipped with compliant closed-vent system and control device</p>
Monitoring Method	Method 21
Repair Requirements	See basic standard
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next management unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in contact with organic hazardous waste by 10% weight</p>

## PRESSURE RELIEF DEVICES IN GAS/VAPOR SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>Information to be kept for all pressure relief devices:</p> <ul style="list-style-type: none"> <li>• pressure relief device ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the pressure relief device</li> <li>• hazardous waste state at the pressure relief device</li> <li>• method of compliance</li> <li>• list of ID numbers of subject pressure relief devices</li> <li>• list of ID numbers for pressure relief devices in gas/vapor service required to comply with "no detectable emissions"</li> <li>• for each compliance test for pressure relief devices designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for pressure relief devices in vacuum service</li> <li>• identification, either by list or location, of 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</li> </ul> <p>The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these hazardous wastes are heavy liquids</li> <li>• up-to-date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject requirements</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:                             <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*                             <ul style="list-style-type: none"> <li>•• the EPA ID number, name and address of the facility</li> <li>•• for each month during the semiannual reporting period:                                     <ul style="list-style-type: none"> <li>••• if control device for any pressure release device exceeded or operated outside of design specification and was not corrected within 24 hours, report the duration and cause of each exceedance, and any correction measures taken.</li> <li>••• dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period</li> </ul> </li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required.</p>

**PUMPS AND VALVES IN HEAVY LIQUID SERVICE, PRESSURE  
RELIEF DEVICES IN LIGHT LIQUID OR HEAVY LIQUID  
SERVICE, AND FLANGES AND OTHER CONNECTORS**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	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
Alternative Standards	N/A
Exemptions	Equipment in vacuum service
Monitoring Method	Method 21
Repair Requirements	First attempt within 5 calendar days of detection  Repair as soon as practicable; no later than 15 days after detection
Delay of Repair	Allowed if technically infeasible without hazardous waste management unit shutdown; required before end of next hazardous waste management unit shutdown  Allowed for equipment that is isolated from the process and that does not remain in contact with organic hazardous waste of at least 10% by weight  Valves: <ul style="list-style-type: none"> <li>• Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a compliant control device when repair occurs</li> <li>• Allowed beyond process unit shutdown if valve assembly replacement is necessary and otherwise sufficient supply of valve assembly replacements is exhausted</li> <li>• Not allowed beyond next shutdown unless next unit shutdown occurs sooner than 6 months after first unit shutdown</li> </ul> Pumps: <ul style="list-style-type: none"> <li>• Repair requires use of dual mechanical seal system that includes barrier fluid and repair completed as soon as practicable but no later than 6 months after leak detected</li> </ul>



**PUMPS AND VALVES IN HEAVY LIQUID SERVICE, PRESSURE  
RELIEF DEVICES IN LIGHT LIQUID OR HEAVY LIQUID  
SERVICE, AND FLANGES AND OTHER CONNECTORS**

APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number, date evidence of a potential leak found, and date leak detected, attached to the leaking equipment</li> </ul> <p>Information to be kept in log for 3 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date evidence of potential leak found</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• documentation supporting delay of repair of a valve</li> <li>• expected date of successful repair if leak is not repaired within 15 days</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all equipment:</p> <ul style="list-style-type: none"> <li>• equipment ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the equipment</li> <li>• hazardous waste state at the equipment</li> <li>• method of compliance</li> <li>• list of ID numbers of subject equipment</li> <li>• list of ID numbers for equipment in vacuum service</li> <li>• identification, either by list or location, of equipment that contains or contacts hazardous waste with an organic content of at least 10% by weight for a period of less than 300 hours per year</li> </ul> <p>Information to be kept for the purpose of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up to date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject</li> </ul>

**PUMPS AND VALVES IN HEAVY LIQUID SERVICE, PRESSURE  
RELIEF DEVICES IN LIGHT LIQUID OR HEAVY LIQUID  
SERVICE, AND FLANGES AND OTHER CONNECTORS**

**APPLICABLE REGULATIONS**

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:               <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*               <ul style="list-style-type: none"> <li>•• the EPA ID number, name, and address of the facility</li> <li>•• dates of hazardous waste management unit shutdowns that occurred within the semiannual period</li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required.</p>

## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	Non-dual mechanical seal pumps: Monitor monthly and conduct weekly visual inspections for indications of liquids dripping from pump seal
Leak Definition	10,000 ppm  Indications of liquids dripping from pump seal
Alternative Standards	No externally actuated shaft penetrating pump housing  Operate with no detectable emissions  Test for compliance upon designation, annually, and when requested by Regional Administrator
Exemptions	Pumps in vacuum service  Any pump equipped with a compliant closed-vent system and control device  Any pump equipped with a dual mechanical seal: specific operating and design requirements (see Dual Mechanical Seal System)  Any pumps designated for no detectable emissions (less than 500 ppm above background) (see No Detectable Emissions)
Monitoring Method	Method 21
Repair Requirements	First attempt within 5 calendar days of detection  Repair as soon as practicable; no later than 15 days after detection
Delay of Repair	Allowed if technically infeasible without hazardous work management unit shutdown; required before end of next hazardous waste management unit shutdown  Allowed for equipment that is isolated from the process and that does not remain in contact with organic hazardous waste at least 10% by weight  Allowed if repair requires use of a dual mechanical seal system that includes a barrier fluid system and repair is completed as soon as practicable, but not later than 6 months after leak detected

## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>When leak detected:</p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number and date leak detected, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired</li> </ul> <p>Information to be kept in log for 3 years after leak detected:</p> <ul style="list-style-type: none"> <li>• instrument ID, operator ID, and equipment ID numbers</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• date of successful repair of the leak</li> </ul> <p>Information to be kept for all pumps:</p> <ul style="list-style-type: none"> <li>• pump ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the pump</li> <li>• hazardous waste state at the pump</li> <li>• method of compliance</li> <li>• list of ID numbers of subject pumps</li> <li>• list of ID numbers of pumps designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for pumps designated for no detectable emissions:                             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> <li>• list of ID numbers for pumps in vacuum service</li> <li>• identification, either by list or location, of 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</li> </ul> <p>Information to be kept for pumps equipped with dual mechanical seal:</p> <ul style="list-style-type: none"> <li>• design criteria for indicating failure</li> <li>• explanation for selected criteria</li> <li>• any changes to the criteria, and reason for change</li> </ul>

## PUMPS IN LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements, continued	<p>The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions:</p> <ul style="list-style-type: none"> <li>• an analysis determining the design capacity of the hazardous waste management unit</li> <li>• a statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these hazardous wastes are heavy liquids</li> <li>• an up-to-date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject.</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:               <ul style="list-style-type: none"> <li>• None</li> </ul> </li> <li>• Part 264:*               <ul style="list-style-type: none"> <li>•• the EPA ID number, name and address of the facility</li> <li>•• for each month during the semiannual reporting period:                   <ul style="list-style-type: none"> <li>••• the ID number for each pump for which a leak was not repaired as required</li> <li>••• if control device for any pump exceeded or operated outside of design specification and was not corrected within 24 hours, report the date, duration and cause of each exceedance, and any correction measures taken.</li> <li>••• dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period</li> </ul> </li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required.</p>

Subpart VV	Subparts J and V	Subparts H and I	40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	Equipped with closed-purge closed vent loop system or closed-vent system that returns the fluid to the process, recycles the purged fluid to a compliant waste management unit, or sends it to a compliant control device
Leak Definition	N/A
Alternative Standards	N/A
Exemptions	Equipment in vacuum service In-situ sampling systems Sampling systems without purges
Monitoring Method	N/A
Repair Requirements	N/A
Delay of Repair	N/A

## SAMPLING CONNECTION SYSTEMS

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements	<p>Information to be kept for all sampling connections:</p> <ul style="list-style-type: none"> <li>• sampling connection system ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the sampling connection system</li> <li>• hazardous wastes state at the sampling connection system</li> <li>• method of compliance</li> <li>• list of ID numbers of sampling connection systems subject to the rule</li> <li>• list of ID number of equipment in vacuum service</li> <li>• identification, either by list or location, of 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</li> </ul> <p>Information to be kept for the purpose of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up-to-date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment and control devices previously determined not to be subject</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:             <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*             <ul style="list-style-type: none"> <li>•• the EPA ID number, name and address of the facility</li> <li>•• for each month during the semiannual reporting period:                 <ul style="list-style-type: none"> <li>••• if control device for any sampling connection system operated outside of design specification and was not corrected within 24 hours, report the duration and cause of each exceedance, and any correction measures taken</li> <li>••• dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period</li> </ul> </li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required.</p>

## VALVES IN GAS/VAPOR AND LIGHT LIQUID SERVICE

### APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Basic Standard	<p>Monthly monitoring</p> <p>If valve does not leak for 2 consecutive months, may be monitored quarterly</p> <p>If valve leaks, monitor monthly until no leak is detected for 2 consecutive months</p>
Leak Definition	10,000 ppm
Alternative Standards	Allowable percentage of valves leaking or skip period leak detection and repair
Exemptions	<p>Valves in vacuum service</p> <p>Valves designated for no detectable emissions (less than 500 ppm above background) (see No Detectable Emissions)</p> <p>No external activating mechanism in contact with hazardous waste stream; is tested for compliance annually, initially, and as requested by the Regional Administrator</p> <p>Valves designated unsafe to monitor: owner/operator follows with plan to monitor as frequently as practicable during safe to monitor times</p> <p>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</p>
Monitoring Method	Method 21
Repair Requirements	<p>First attempt within 5 calendar days of detection</p> <p>Repair as soon as practicable; no later than 15 days after detection</p>



# VALVES IN GAS/VAPOR AND LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Delay of Repair	<p>Allowed if technically infeasible without process unit shutdown; required before end of next process unit shutdown</p> <p>Allowed for equipment that is isolated from the process and that does not remain in contact with organic hazardous waste at least 10% by weight</p> <p>Allowed if emissions of purged material from immediate repair would exceed fugitive emissions from delay of repair, and purged materials are collected and destroyed or recovered in a compliant control device when repair occurs</p> <p>Allowed beyond process unit shutdown if valve assembly replacement is necessary and otherwise sufficient supply of valve assembly replacements is exhausted</p> <p>Not allowed beyond next unit shutdown unless next unit shutdown occurs sooner than 6 months after first unit shutdown</p>
Recordkeeping Requirements	<p><b>When leak detected:</b></p> <ul style="list-style-type: none"> <li>• a weather-proof and readily visible identification, marked with the equipment ID number and date leak detected, attached to the leaking equipment</li> <li>• ID may be removed after it has been repaired and monitored for 2 successive months with no leaks detected during those two months</li> </ul> <p><b>Information to be kept in log for 3 years after leak detected:</b></p> <ul style="list-style-type: none"> <li>• instrument and operator ID numbers and equipment ID number</li> <li>• date leak detected</li> <li>• dates of each attempt to repair leak</li> <li>• repair methods applied in each attempt to repair</li> <li>• "above 10,000" if maximum instrument reading after each repair attempt is <math>\geq 10,000</math> ppm</li> <li>• "repair delayed" and reason for delay if leak not repaired within 15 calendar days after detection</li> <li>• signature of owner/operator whose decision it was that repair could not be effected without a process shutdown</li> <li>• documentation supporting delay of repair</li> <li>• expected date of successful repair if leak is not repaired within the 15 days</li> <li>• date of successful repair of the leak</li> </ul> <p><b>Information to be kept for all valves:</b></p> <ul style="list-style-type: none"> <li>• valve ID number and hazardous waste management unit identification</li> <li>• approximate facility location</li> <li>• type of equipment</li> <li>• percent-by-weight of total organics in hazardous waste at the valve</li> <li>• hazardous waste state at the valve</li> <li>• method of compliance</li> <li>• list of ID numbers of subject valves</li> <li>• list of ID numbers of valves designated for no detectable emissions and signed by owner/operator</li> <li>• for each compliance test for valves designated for no detectable emissions:             <ul style="list-style-type: none"> <li>•• date conducted</li> <li>•• background level measured</li> <li>•• maximum instrument reading</li> </ul> </li> </ul> <p style="text-align: right;">(Continued on next page)</p>

# VALVES IN GAS/VAPOR AND LIGHT LIQUID SERVICE

## APPLICABLE REGULATIONS

40 CFR Part 60, Subpart VV	40 CFR Part 61, Subparts J and V	40 CFR Part 63, Subparts H and I	40 CFR Part 264, Subpart BB 40 CFR Part 265, Subpart BB

ITEM	REQUIREMENTS
Recordkeeping Requirements, continued	<ul style="list-style-type: none"> <li>• list of ID numbers for valves in vacuum service</li> <li>• identification, either by list or location, of 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</li> </ul> <p>Information to be kept for unsafe or difficult to monitor valves:</p> <ul style="list-style-type: none"> <li>• list of ID numbers</li> <li>• explanation for designation</li> <li>• planned schedule for monitoring</li> </ul> <p>Information to be kept for valves complying with the skip leak detection and repair alternative standards:</p> <ul style="list-style-type: none"> <li>• schedule of monitoring</li> <li>• percent of valves found leaking during each monitoring period</li> </ul> <p>Information to be kept for the purposes of determining exemptions:</p> <ul style="list-style-type: none"> <li>• analysis determining the design capacity of the hazardous waste management unit</li> <li>• statement listing the hazardous waste influent to and effluent from each hazardous waste management unit and an analysis determining whether these are heavy liquids</li> <li>• up-to-date analysis and supporting information and data used to determine if equipment is subject to the requirements of the rule including supporting documentation required by 264.1063(d)(3) and 265.1063(d)(3). 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 equipment previously determined not to be subject</li> </ul>
Reporting Requirements	<p>Semiannual report requirements:</p> <ul style="list-style-type: none"> <li>• Part 265:                             <ul style="list-style-type: none"> <li>•• None</li> </ul> </li> <li>• Part 264:*                             <ul style="list-style-type: none"> <li>•• the EPA ID number, name and address of the facility</li> <li>•• for each month during the semiannual reporting period:                                     <ul style="list-style-type: none"> <li>••• the ID number for each valve for which a leak was not repaired as required</li> <li>••• dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period</li> </ul> </li> </ul> </li> </ul> <p>* If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required, and no control device exceeds or operates outside of design specifications for more than 24 hours, a report is not required.</p>

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