

# Subpart GGG-Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries

## Applicability of affected facility - §60.590

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) The provisions of this subpart apply to affected facilities in petroleum refineries.               <ol style="list-style-type: none"> <li>a.) A compressor is an affected facility.</li> <li>b.) The group of all the equipment (defined in §60.591) within a process unit is an affected facility.</li> </ol> </li> <li>2.) Any affected facility under paragraph (1) of this section that commences construction or modification after January 4, 1983, is subject to the requirements of this subpart.</li> <li>3.) Addition or replacement of equipment (defined in § 60.591) for the purpose of process improvement which is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.</li> <li>4.) Facilities subject to subpart VV or subpart KKK of 40 CFR part 60 are excluded from this subpart.</li> </ol>

## Standards - §60.592 (§60.482 - §60.483)

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) Each owner or operator subject to the provisions of this subpart shall comply with the requirements of §§60.482-1 to 60.482-10 as soon as practicable, but no later than 180 days after initial startup.</li> <li>2.) An owner or operator may elect to comply with the requirements of §§60.483-1 and 60.483-2.</li> <li>3.) An owner or operator may apply to the Administrator for a determination of equivalency for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this subpart. In doing so, the owner or operator shall comply with requirements of §60.484.</li> <li>4.) Each owner or operator subject to the provisions of this subpart shall comply with the provisions of §60.485 except as provided in §60.593.</li> <li>5.) Each owner or operator subject to the provisions of this subpart shall comply with the provisions of §§60.486 and 60.487.</li> </ol>

## Standards

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) Each owner or operator subject to the provisions of this subpart shall demonstrate compliance with the requirements of §§60.482-1 to 60.482-10 for all equipment within 180 days of initial startup.</li> <li>2.) Compliance with §§60.482-1 to 60.482-10 will be determined by review of records and reports, review of performance test results, and inspection using the methods and procedures specified in §60.485.</li> <li>3.) An owner or operator may request a determination of equivalence of a means of emission limitation to the requirements of §§60.482-2, 60.482-3, 60.482-5, 60.482-6, 60.482-7, 60.482- 8, and 60.482-10 as provided in §60.484.</li> <li>4.) If the Administrator makes a determination that a means of emission limitation is at least equivalent to the requirements of §§60.482-2, 60.482-3, 60.482-5, 60.482-6, 60.482-7, 60.482- 8, or 60.482-10, an owner or operator shall comply with the requirements of that determination.</li> <li>5.) Equipment that is in vacuum service is excluded from the requirements of §§60.482-2 to 60.482-10 if it is identified as required in §60.486(e)(5)</li> </ol>
Pumps in light liquid service	<ol style="list-style-type: none"> <li>1.) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in §60.485(b), except as provided in §60.482-1(c) and paragraphs (d), (e), and (f) of this section.</li> <li>2.) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.</li> <li>3.) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.</li> <li>4.) If there are indications of liquids dripping from the pump seal, a leak is detected.</li> <li>5.) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482-9.</li> <li>6.) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.</li> <li>7.) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a), provided the requirements found in §60.482-2 (d) (1-6) are met.</li> <li>8.) Any pump that is designated, as described in §60.486(e)(1) and (2), for no detectable emission, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) if the pump: <ol style="list-style-type: none"> <li>a.) Has no externally actuated shaft penetrating the pump housing,</li> <li>b.) Is demonstrated to be operating with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in §60.485(c), and</li> <li>c.) Is tested for compliance with paragraph (e)(2) initially upon designation, annually, and at other times requested by the Administrator.</li> </ol> </li> <li>9.) If any pump is equipped with a closed vent system capable of capturing and transporting any leakage from the seal or seals to a control device that complies with the requirements of §60.482- 10, it is exempt from the paragraphs (a) through (e).</li> </ol>

Compressors	<ol style="list-style-type: none"> <li>1.) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of VOC to the atmosphere, except as provided in §60.482-1(c) and paragraph (h) and (i) of this section.</li> <li>2.) Each compressor seal system as required in paragraph (a) shall be: <ol style="list-style-type: none"> <li>a.) Operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure; or</li> <li>b.) Equipped with a barrier fluid system that is connected by a closed vent system to a control device that complies with the requirements of §60.482-10; or</li> <li>c.) Equipped with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere.</li> </ol> </li> <li>3.) The barrier fluid system shall be in heavy liquid service or shall not be in VOC service.</li> <li>4.) Each barrier fluid system as described in paragraph (a) shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.</li> <li>5.) <ol style="list-style-type: none"> <li>a.) Each sensor as required in paragraph (d) shall be checked daily or shall be equipped with an audible alarm.</li> <li>b.) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.</li> </ol> </li> <li>6.) If the sensor indicates failure of the seal system, the barrier system, or both based on the criterion determined under paragraph (e)(2), a leak is detected.</li> <li>7. <ol style="list-style-type: none"> <li>a. When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482-9.</li> <li>b.) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.</li> </ol> </li> <li>8.) A compressor is exempt from the requirements of paragraphs (a) and (b), if it is equipped with a closed vent system capable of capturing and transporting any leakage from the seal to a control device that complies with the requirements of §60.482- 10, except as provided in paragraph (i) of this section.</li> <li>9.) Any compressor that is designated, as described in §60.486(e) (1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a)-(h) if the compressor: <ol style="list-style-type: none"> <li>a.) Is demonstrated to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the methods specified in §60.485(c); and</li> <li>b.) Is tested for compliance with paragraph (i)(1) initially upon designation, annually, and at other times requested by the Administrator.</li> </ol> </li> <li>10.) Any existing reciprocating compressor in a process unit which becomes an affected facility under provisions of §60.14 or §60.15 is exempt from §60.482(a), (b), (c), (d), (e), and (h), provided the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance with the provisions of paragraphs (a) through (e) and (h) of this section.</li> </ol>
Pressure relief devices in gas/vapor service	<ol style="list-style-type: none"> <li>1.) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as determined by the methods specified in §60.485(c).</li> <li>2.) <ol style="list-style-type: none"> <li>a.) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after the pressure release, except as provided in §60.482- 9.</li> <li>b.) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the conditions of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, by the methods specified in §60.485(c).</li> </ol> </li> <li>3.) Any pressure relief device that is equipped with a closed vent system capable of capturing and transporting leakage through the pressure relief device to a control device as described in §60.482-10 is exempted from the requirements of paragraphs (a) and (b).</li> </ol>

<p>Sampling connection systems</p>	<ol style="list-style-type: none"> <li>1.) Each sampling connection system shall be equipped with a closed purge system or closed vent system, except as provided in §60.482-1(c).</li> <li>2.) Each closed purge system or closed vent system as required in paragraph (1) shall: <ol style="list-style-type: none"> <li>a.) Return the purged process fluid directly to the process line with zero VOC emissions to the atmosphere; or</li> <li>b.) Collect and recycle the purged process fluid with zero VOC emissions to the atmosphere; or</li> <li>c.) Be designed and operated to capture and transport all the purged process fluid to a control device that complies with the requirements of §60.482-10.</li> </ol> </li> <li>3.) In-situ sampling systems are exempt from paragraphs (1) and (2).</li> </ol>
<p>Open-ended valves or lines</p>	<ol style="list-style-type: none"> <li>1.) <ol style="list-style-type: none"> <li>a.) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in §60.482-1(c).</li> <li>b.) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line.</li> </ol> </li> <li>2.) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed.</li> <li>3.) When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (1) at all other times.</li> </ol>

<p>Valves in gas/vapor service in light liquid service</p>	<ol style="list-style-type: none"> <li>1.) Each valve shall be monitored monthly to detect leaks by the methods specified in §60.485(b) and shall comply with paragraphs (b) through (e), except as provided in paragraphs (f), (g), and (h), §60.483-1, 2, and §60.482-1(c).</li> <li>2.) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.</li> <li>3.) <ol style="list-style-type: none"> <li>a.) Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected.</li> <li>b.) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.</li> </ol> </li> <li>4.) <ol style="list-style-type: none"> <li>a.) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §60.482-9.</li> <li>b.) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.</li> </ol> </li> <li>5.) First attempts at repair include, but are not limited to, the following best practices where practicable: <ol style="list-style-type: none"> <li>a.) Tightening of bonnet bolts;</li> <li>b.) Replacement of bonnet bolts;</li> <li>c.) Tightening of packing gland nuts;</li> <li>d.) Injection of lubricant into lubricated packing.</li> </ol> </li> <li>6.) Any valve that is designated, as described in §60.486(e)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) if the valve: <ol style="list-style-type: none"> <li>a.) Has no external actuating mechanism in contact with the process fluid,</li> <li>b.) Is operated with emissions less than 500 ppm above background as determined by the method specified in §60.485(c), and</li> <li>c.) Is tested for compliance with paragraph (f)(2) initially upon designation, annually, and at other times requested by the Administrator.</li> </ol> </li> <li>7.) Any valve that is designated, as described in §60.486(f)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) if: <ol style="list-style-type: none"> <li>a.) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a), and</li> <li>b.) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.</li> </ol> </li> <li>8.) Any valve that is designated, as described in §60.486(f)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) if: <ol style="list-style-type: none"> <li>a.) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.</li> <li>b.) The process unit within which the valve is located either becomes an affected facility through §60.14 or §60.15 or the owner or operator designates less than 3.0 percent of the total number of valves as difficult-to-monitor, and</li> <li>c.) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.</li> </ol> </li> </ol>
<p>Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors</p>	<ol style="list-style-type: none"> <li>1.) Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors shall be monitored within 5 days by the method specified in §60.485(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.</li> <li>2.) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.</li> <li>3.) <ol style="list-style-type: none"> <li>a.) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482-9.</li> <li>b.) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.</li> </ol> </li> <li>4.) First attempts at repair include, but are not limited to, the best practices described under §60.482-7(e).</li> </ol>

<p>Delay of repair</p>	<ol style="list-style-type: none"> <li>1.) Delay of repair of equipment for which leaks have been detected will be allowed if the repair is technically infeasible without a process unit shutdown. Repair of this equipment shall occur before the end of the next process unit shutdown.</li> <li>2.) Delay of repair of equipment will be allowed for equipment which is isolated from the process and which does not remain in VOC service.</li> <li>3.) Delay of repair for valves will be allowed if: <ol style="list-style-type: none"> <li>a.) The owner or operator demonstrates that emissions of purged material resulting from immediate repair are greater than the fugitive emissions likely to result from delay of repair, and</li> <li>b.) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with §60.482-10.</li> </ol> </li> <li>4.) Delay of repair for pumps will be allowed if: <ol style="list-style-type: none"> <li>a.) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system, and</li> <li>b.) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.</li> </ol> </li> <li>5.) Delay of repair beyond a process unit shutdown will be allowed for a valve, if valve assembly replacement is necessary during the process unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next process unit shutdown will not be allowed unless the next process unit shutdown occurs sooner than 6 months after the first process unit shutdown.</li> </ol>
<p>Closed vent systems and control devices</p>	<ol style="list-style-type: none"> <li>1.) Owners or operators of closed vent systems and control devices used to comply with provisions of this subpart shall comply with the provisions of this section.</li> <li>2.) Vapor recovery systems (for example, condensers and adsorbers) shall be designed and operated to recover the VOC emissions vented to them with an efficiency of 95 percent or greater.</li> <li>3.) Enclosed combustion devices shall be designed and operated to reduce the VOC emissions vented to them with an efficiency of 95 percent or greater, or to provide a minimum residence time of 0.75 seconds at a minimum temperature of 816°C.</li> <li>4.) Flares used to comply with this subpart shall comply with the requirements of §60.18.</li> <li>5.) Owners or operators of control devices used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs.</li> <li>6.) <ol style="list-style-type: none"> <li>a.) Closed vent systems shall be designed and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background and visual inspections, as determined by the methods specified in §60.485(c).</li> <li>b.) Closed vent systems shall be monitored to determine compliance with this section initially in accordance with §60.8, annually and at other times requested by the Administrator.</li> </ol> </li> <li>7.) Closed vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.</li> </ol>

### Alternative standards for valves-allowable percentage of valves leaking - §60.483-1

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) An owner or operator may elect to comply with an allowable percentage of valves leaking of equal to or less than 2.0 percent.</li> <li>2.) The following requirements shall be met if an owner or operator wishes to comply with an allowable percentage of valves leaking: <ol style="list-style-type: none"> <li>a.) An owner or operator must notify the Administrator that the owner or operator has elected to comply with the allowable percentage of valves leaking before implementing this alternative standard, as specified in §60.487(b).</li> <li>b.) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Administrator.</li> <li>c.) If a valve leak is detected, it shall be repaired in accordance with §60.482-7(d) and (e).</li> </ol> </li> <li>3.) Performance tests shall be conducted in the following manner: <ol style="list-style-type: none"> <li>a.) All valves in gas/vapor and light liquid service within the affected facility shall be monitored within 1 week by the methods specified in §60.485(b).</li> <li>b.) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.</li> <li>c.) The leak percentage shall be determined by dividing the number of valves for which leaks are detected by the number of valves in gas/vapor and light liquid service within the affected facility.</li> </ol> </li> <li>4.) Owners and operators who elect to comply with this alternative standard shall not have an affected facility with a leak percentage greater than 2.0 percent.</li> </ol>

### Alternative standards for valves-skip period leak detection and repair - §60.483-2

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) <ol style="list-style-type: none"> <li>a.) An owner or operator may elect to comply with one of the alternative work practices specified in paragraphs (b)(2) and (3) of this section.</li> <li>b.) An owner or operator must notify the Administrator before implementing one of the alternative work practices, as specified in §60.487(b).</li> </ol> </li> <li>2.) <ol style="list-style-type: none"> <li>a.) An owner or operator shall comply initially with the requirements for valves in gas/vapor service and valves in light liquid service, as described in §60.482-7. <ol style="list-style-type: none"> <li>b.) After 2 consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip 1 of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.</li> <li>c.) After 5 consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip 3 of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.</li> <li>d.) If the percent of valves leaking is greater than 2.0, the owner or operator shall comply with the requirements as described in §60.482-7 but can again elect to use this section.</li> <li>e.) The percent of valves leaking shall be determined by dividing the sum of valves found leaking during current monitoring and valves for which repair has been delayed by the total number of valves subject to the requirements of this section.</li> <li>f.) An owner or operator must keep a record of the percent of valves found leaking during each leak detection period.</li> </ol> </li> </ol> </li> </ol>

## Equivalence of means of emission limitation - §60.484

Source	All Emissions
General	<ol style="list-style-type: none"><li>1.) Each owner or operator subject to the provisions of this subpart may apply to the Administrator for determination of equivalence for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this subpart.</li><li>2.) Determination of equivalence to the equipment, design, and operational requirements of this subpart will be evaluated by the following guidelines:<ol style="list-style-type: none"><li>a.) Each owner or operator applying for an equivalence determination shall be responsible for collecting and verifying test data to demonstrate equivalence of means of emission limitation.</li><li>b.) The Administrator will compare test data for the means of emission limitation to test data for the equipment, design, and operational requirements.</li><li>c.) The Administrator may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the equipment, design, and operational requirements.</li></ol></li><li>3.) Determination of equivalence to the required work practices in this subpart will be evaluated by the following guidelines:<ol style="list-style-type: none"><li>a.) Each owner or operator applying for a determination of equivalence shall be responsible for collecting and verifying test data to demonstrate equivalence of an equivalent means of emission limitation.</li><li>b.) For each affected facility for which a determination of equivalence is requested, the emission reduction achieved by the required work practice shall be demonstrated.</li><li>c.) For each affected facility, for which a determination of equivalence is requested, the emission reduction achieved by the equivalent means of emission limitation shall be demonstrated.</li><li>d.) Each owner or operator applying for a determination of equivalence shall commit in writing to work practice(s) that provide for emission reductions equal to or greater than the emission reductions achieved by the required work practice.</li><li>e.) The Administrator will compare the demonstrated emission reduction for the equivalent means of emission limitation to the demonstrated emission reduction for the required work practices and will consider the commitment in paragraph (c)(4).</li><li>f.) The Administrator may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the required work practice.</li></ol></li><li>4.) An owner or operator may offer a unique approach to demonstrate the equivalence of any equivalent means of emission limitation.</li><li>5.)<ol style="list-style-type: none"><li>a.) After a request for determination of equivalence is received, the Administrator will publish a notice in the Federal Register and provide the opportunity for public hearing if the Administrator judges that the request may be approved.</li><li>b.) After notice and opportunity for public hearing, the Administrator will determine the equivalence of a means of emission limitation and will publish the determination in the Federal Register.</li><li>c.) Any equivalent means of emission limitations approved under this section shall constitute a required work practice, equipment, design, or operational standard within the meaning of section 111(h)(1) of the Clean Air Act.</li></ol></li><li>6.)<ol style="list-style-type: none"><li>a.) Manufacturers of equipment used to control equipment leaks of VOC may apply to the Administrator for determination of equivalence for any equivalent means of emission limitation that achieves a reduction in emissions of VOC achieved by the equipment, design, and operational requirements of this subpart.</li><li>b.) The Administrator will make an equivalence determination according to the provisions of paragraphs (b), (c), (d), and (e).</li></ol></li></ol>



## Test methods and procedures - §60.485

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) In conducting the performance tests required in §60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in §60.8(b).</li> <li>2.) The owner or operator shall determine compliance with the standards in §§60.482, 60.483, and 60.484 as follows:             <ol style="list-style-type: none"> <li>a.) Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used:                 <ol style="list-style-type: none"> <li>(i) Zero air (less than 10 ppm of hydrocarbon in air); and</li> <li>(ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane.</li> </ol> </li> </ol> </li> <li>3.) The owner or operator shall determine compliance with the no detectable emission standards in §§60.482-2(e), 60.482- 3(i), 60.482-4, 60.482-7(f), and 60.482-10(e) as follows:             <ol style="list-style-type: none"> <li>a.) The requirements of paragraph (b) shall apply.</li> <li>b.) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicates by the instrument and the background level is compared with 500 ppm for determining compliance.</li> </ol> </li> <li>4.) The owner or operator shall test each piece of equipment unless he demonstrates that a process unit is not in VOC series, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used:             <ol style="list-style-type: none"> <li>a.) Procedures that conform to the general methods in ASTM E-260, E-168, E-169 (incorporated by reference-see §60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment.</li> <li>b.) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid.</li> <li>c.) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, paragraphs (d) (1) and (2) of this section shall be used to resolve the disagreement.</li> </ol> </li> <li>5.) The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply:             <ol style="list-style-type: none"> <li>a.) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C. Standard reference texts or ASTM D-2879 (incorporated by reference-see §60.17) shall be used to determine the vapor pressures.</li> <li>b.) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 C is equal to or greater than 20 percent by weight.</li> <li>c.) The fluid is a liquid at operating conditions.</li> </ol> </li> <li>6.) Samples used in conjunction with paragraphs (d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare.</li> <li>7.) The owner or operator shall determine compliance with the standards of flares as follows:             <ol style="list-style-type: none"> <li>a.) Method 22 shall be used to determine visible emissions.</li> <li>b.) See §60.458 (g) (3-6) for futher information on flare operations.</li> </ol> </li> </ol>

## Recordkeeping requirements - §60.486

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) a.) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.</li> <li>    b.) An owner or operator of more than one affected facility subject to the provisions of this subpart may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility.</li> <li>2.) When each leak is detected as specified in §§60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the requirements of §60.486 (b) (1-3) apply</li> <li>3.) When each leak is detected as specified in §§60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the information found in §60.486 (c) (1-9) shall be recorded in a log and shall be kept for 2 years in a readily accessible location.</li> <li>4.) The information found in §60.486 (d) (1-5) pertaining to the design requirements for closed vent systems and control devices described in §60.482- 10 shall be recorded and kept in a readily accessible location.</li> <li>5.) The information found in §60.486 (e) (1-5) pertaining to all equipment subject to the requirements in §§60.482-1 to 60.482-10 shall be recorded in a log that is kept in a readily accessible location.</li> <li>6.) The information found in §60.486 (f) (1-2) pertaining to all valves subject to the requirements of §60.482-7(g) and (h) shall be recorded in a log that is kept in a readily accessible location.</li> <li>7.) The information found in §60.486 (g) (1-2) shall be recorded for valves complying with §60.483-2.</li> <li>8.) The information found in §60.486 (h) (1-2) shall be recorded in a log that is kept in a readily accessible location.</li> <li>9.) The information found in §60.486 (i) (1-3) shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in §60.480(d).</li> <li>10.) Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location.</li> <li>11.) The provisions of §60.7 (b) and (d) do not apply to affected facilities subject to this subpart.</li> </ol>

## Reporting requirements - §60.487

Source	All Emissions
General	<ol style="list-style-type: none"> <li>1.) Each owner or operator subject to the provisions of this subpart shall submit semiannual reports to the Administrator beginning six months after the initial start up date.</li> <li>2.) The initial semiannual report to the Administrator shall include the information found in §60.487 (b) (1-4).</li> <li>3.) All semiannual reports to the Administrator shall include the information, summarized from the information in §60.486. and found in §60.487 (c) (1-4).</li> <li>4.) An owner or operator electing to comply with the provisions of §§60.483-1 and 60.483-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions.</li> <li>5.) An owner or operator shall report the results of all performance tests in accordance with § 60.8 of the General Provisions. The provisions of §60.8(d) do not apply to affected facilities subject to the provisions of this subpart except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests.</li> <li>6.) The requirements of paragraphs (a) through (c) of this section remain in force until and unless EPA, in delegating enforcement authority to a State under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such State. In that event, affected sources within the State will be relieved of the obligation to comply with the requirements of paragraphs (a) through (c) of this section, provided that they comply with the requirements established by the State.</li> </ol>

## Exceptions - §60.593

Source	All Emissions
General	<ol style="list-style-type: none"><li>1.) Each owner or operator subject to the provisions of this subpart may comply with the following exceptions to the provisions of subpart VV.</li><li>2.)<ol style="list-style-type: none"><li>a.) Compressors in hydrogen service are exempt from the requirements of §60.592 if an owner or operator demonstrates that a compressor is in hydrogen service.</li><li>b.) Each compressor is presumed not be be in hydrogen service unless an owner or operator demonstrates that the piece of equipment is in hydrogen service. For a piece of equipment to be considered in hydrogen service, it must be determined that the percent hydrogen content can be reasonably expected always to exceed 50 percent by volume. For purposes of determining the percent hydrogen content in the process fluid that is contained in or contacts a compressor, procedures that conform to the general method described in ASTM E-260, E-168, or E-169 (incorporated by reference as specified in § 60.17) shall be used.</li><li>c.)<ol style="list-style-type: none"><li>(i) An owner or operator may use engineering judgment rather than procedures in paragraph (b)(2) of this section to demonstrate that the percent content exceeds 50 percent by volume, provided the engineering judgment demonstrates that the content clearly exceeds 50 percent by volume. When an owner or operator and the Administrator do not agree on whether a piece of equipment is in hydrogen service, however, the procedures in paragraph (b)(2) shall be used to resolve the disagreement.</li><li>(ii) If an owner or operator determines that a piece of equipment is in hydrogen service, the determination can be revised only after following the procedures in paragraph (b)(2).</li></ol></li></ol></li><li>3.) Any existing reciprocating compressor that becomes an affected facility under provisions of §60.14 or § 60.15 is exempt from §60.482 (a), (b), (c), (d), (e), and (h) provided the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance with the provisions of §60.482 (a), (b), (c), (d), (e), and (h).</li><li>4.) An owner or operator may use the following provision in addition to §60.485(e): Equipment is in light liquid service if the percent evaporated is greater than 10 percent at 150°C as determined by ASTM Method D-86 (incorporated by reference as specified in §60.18).</li><li>5.) Pumps in light liquid service and valves in gas/vapor and light liquid service within a process unit that is located in the Alaskan North Slope are exempt from the requirements of §§60.482-2 and 60.482-7.</li></ol>