

RULE 4311 FLARES (Adopted June 20, 2002; Amended June 15, 2006; Amended June 18, 2009; Amended [rule adoption date])

1.0 Purpose

To limit the emissions of volatile organic compounds (VOC), oxides of nitrogen (NO_x), and sulfur oxides (SO_x) from the operation of flares.

2.0 Applicability

This rule is applicable to operations involving the use of flares.

3.0 Definitions

3.1 Air-Assisted Flare: a combustion device where forced air is injected to promote turbulence for mixing and to provide combustion air.

3.2 Air Pollution Control Officer (APCO): as defined in Rule 1020 (Definitions).

3.3 Air Resources Board (ARB): as defined in Rule 1020 (Definitions).

3.4 Annual Throughput: the volume of vent gas, converted to heat input in million Btu (MMBtu), that is combusted in a flare in one calendar year.

3.45 British Thermal Unit (Btu): the amount of heat required to raise the temperature of one pound of water from 59°F to 60°F at one atmosphere.

3.56 Calendar Day: any day starting at twelve o'clock AM and ending at 11:59 PM.

3.7 Chemical Operations: facilities engaged in chemical production or distribution including fuel production.

3.68 Coanda Effect Flare: A flare in which the high pressure flare gas flows along a curved surface inspirating air into the gas to promote combustion.

3.9 Digester Operation: a facility that produces gas consisting of methane, carbon dioxide, and traces of other contaminant gases, from either mesophilic or thermophilic digestion of biodegradable waste.

3.710 Emergency: any situation or a condition arising from a sudden and reasonably unforeseeable and unpreventable event beyond the control of the operator. Examples include, but are not limited to, not preventable equipment failure, natural disaster, act of war or terrorism, or external power curtailment, excluding a power curtailment due to an interruptible power service agreement from a utility. A flaring event due to improperly designed equipment, lack of preventative maintenance, careless or improper operation, operator error or willful misconduct does not qualify as an emergency. An emergency

situation requires immediate corrective action to restore safe operation. A planned flaring event shall not be considered as an emergency.

- 3.811 Enclosed Flare: a flare composed of multiple gas burners that are grouped in an enclosure, and are staged to operate at a wide range of flow rates.
- 3.912 EPA: United States Environmental Protection Agency.
- 3.103 Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.
- 3.144 Flare: ~~a combustion device that oxidizes combustible gases or vapors, where the combustible gases or vapors being destroyed are routed into the burner without heat recovery, a direct combustion device in which air and all combustible gases react at the burner with the objective of complete and instantaneous oxidation of the combustible gases. Flares are used either continuously or intermittently and are not equipped with devices for fuel-air mix control or for temperature control.~~
- 3.125 Flare Event: any intentional or unintentional combustion of vent gas in a flare. The flare event ends when the flow velocity drops below 0.12 feet per second or when the operator can demonstrate that no more vent gas was combusted based upon the monitoring records of the flare water seal level and/or other parameters as approved by the APCO in the Flare Monitoring and Recording Plan. For a flare event that continues for more than one calendar day, each calendar day or venting of gases shall constitute a separate flare event.
- 3.136 Flare Gas: gas burned in a flare.
- 3.147 Flare Minimization Plan (FMP): a document intended to meet the requirements of Section 6.5 of this Rule.
- 3.158 Flare Monitoring System: all flare monitoring and recording equipment used for the determination of flare operating parameters. Flare monitoring and recording equipment includes, but is not limited to, sample systems, transducers, transmitters, data acquisition equipment, data recording equipment, and video monitoring equipment and video recording equipment.
- ~~3.16 Flexigas: a low BTU fuel gas produced by gasifying coke produced in a fluid-bed Coker. Due to the air used in the gasifying process, Flexigas is approximately 50% nitrogen.~~
- 3.179 Gaseous Fuel: any gases used as combustion fuel which include, but are not limited to, any natural, process, synthetic, landfill, sewage digester, or waste gases. Gaseous fuels include produced gas, pilot gas and, when burned, purge gas.

- 3.20 Landfill Operation: facilities engaged in operating landfills as defined in the North American Industry Classification System 562211 (Hazardous Waste Treatment and Disposal) or 562212 (Solid Waste Landfill).
- 3.21 Major Source: as defined in Rule 2201 (New and Modified Stationary Source Review Rule).
- ~~3.18~~22 MMBtu: million British thermal units.
- 3.23 MMscf: million standard cubic feet
- ~~3.19~~24 Non-Assisted Flare: a combustion device without any auxiliary provision for enhancing the mixing of air into its flame. This definition does not include those flares that by design provide excess air at the flare tip.
- 3.205 NOx: any nitrogen oxide compounds.
- 3.26 Oil and Gas Operation: facilities engaged in crude oil or gas production, gas processing, or refining.
- ~~3.24~~7 Open Flare: a vertically or horizontally oriented open pipe flare from which gases are released into the air before combustion is commenced.
- ~~3.22~~8 Operator: includes, but not limited to, any person who owns, leases, supervises, or operates a facility.
- 3.29 Organic Liquid Loading Operation: as defined in Rule 4624 (Transfer of Organic Liquid).
- ~~3.23~~30 Petroleum Refinery: a facility that processes petroleum, as defined in the Standard Industrial Classification Manual as Industry No. 2911, Petroleum Refining. For the purpose of this rule, all portions of the petroleum refining operation, including those at non-contiguous locations operating flares, shall be considered as one petroleum refinery.
- ~~3.24~~31 Pilot: an auxiliary burner used to ignite the vent gas routed to a flare.
- ~~3.25~~32 Pilot Gas: the gas used to maintain the presence of a flame for ignition of vent gases.
- ~~3.26~~33 Planned Flaring: a flaring operation that constitutes a designed and planned process at a source, and which would have been reasonably foreseen ahead of its actual occurrence, or is scheduled to occur. Planned flaring includes, but is not limited to, the following flaring activities:
- ~~3.26~~33.1 Oil or gas well tests, well related work, tests ordered by a regulatory agency.

- 3.2633.2 Equipment depressurization for maintenance purposes.
 - 3.2633.3 Equipment start-up or shutdown.
 - 3.2633.4 Flaring of gas at production sources where no gas handling, gas injection or gas transmission facilities exists.
 - 3.2633.5 Flaring of off-specification gas (i.e. non-PUC quality gas), unless the operator can demonstrate that the gas must be flared for engineering or safety reasons, e.g., under emergency.
 - 3.2633.6 The operation of a flare for the purpose of performing equipment maintenance.
- 3.2734 Prevention Measure: a component, system, procedure, or program that will minimize or eliminate flaring.
- 3.2835 Public Utilities Commission (PUC) Quality Gas: any gaseous fuel, gas containing fuel where the sulfur content is no more than one-fourth (0.25) grain of hydrogen sulfide per one hundred (100) standard cubic feet and no more than five grains of total sulfur per one hundred (100) standard cubic feet. PUC quality gas shall also mean high methane (at least 80% by volume) gas as specified in PUC's General Order 58-A.
- 3.36 Publicly-Owned Facility: A wastewater treatment facility or landfill facility owned and operated by a public agency.
- 3.2937 Purge Gas: Nitrogen, carbon dioxide, liquefied petroleum gas, refinery fuel gas, or natural gas, any of which can be used to maintain a non-explosive mixture of gases in the flare header or provide sufficient exit velocity to prevent any regressive flame travel back into the flare header.
- 3.308 Refinery Fuel Gas: a combustible gas, which is a by-product of the refinery process.
- 3.39 Regeneration Gas: Purge gas from a system consisting of several media trains that is used to remove impurities from combustible gas vapors that is regenerated by purging with gas.
- 3.3140 Reportable Flaring Event: any flaring where more than 500,000 standard cubic feet of vent gas is flared per calendar day, or where sulfur oxide emissions are greater than 500 pounds per calendar day. A reportable flaring event ends when it can be demonstrated by monitoring required in Section 6.8 that the integrity of the water seal has been maintained sufficiently to prevent vent gas to the flare tip. For flares without water seals or water seal monitors as required by Section 6.8, a reportable flaring event ends when the rate of flow of vent gas falls below 0.12 feet per second.

- ~~3.32~~41 Representative Sample: a sample of vent gas collected from the location as approved for flare monitoring and analyzed utilizing test methods specified in Section 6.3.4.
- ~~3.33~~42 Shutdown: the procedure by which the operation of a process unit or piece of equipment is stopped due to the end of a production run, or for the purpose of performing maintenance, repair and replacement of equipment. Stoppage caused by frequent breakdown due to poor maintenance or operator error shall not be deemed a shutdown.
- ~~3.34~~3 Startup: the procedure by which a process unit or piece of equipment achieves normal operational status, as indicated by such parameters as temperature, pressure, feed rate and product quality.
- ~~3.35~~44 Steam-Assisted Flare: a combustion device where steam is injected into the combustion zone to promote turbulence for the mixing of the combustion air before it is introduced to the flame.
- ~~3.36~~ Thermal oxidizer: an enclosed or partially enclosed combustion device, other than a flare, that is used to oxidize combustible gases.
- ~~3.37~~45 Total Organic Gases (TOG): all hydrocarbon compounds containing hydrogen and carbon with or without other chemical elements.
- ~~3.38~~46 Turnaround: a planned activity involving shutdown and startup of one or several process units for the purpose of performing periodic maintenance, repair, replacement of equipment or installation of new equipment.
- ~~3.39~~47 Vent Gas: any gas directed into a flare, excluding assisting air or steam, flare pilot gas, and any continuous purge gases.
- ~~3.40~~48 Volatile Organic Compound (VOC): as defined in Rule 1020 (Definitions).
- ~~3.41~~49 Water Seal: a liquid barrier, or seal, to prevent the passage of gas. Water seals provide a positive means of flash-back prevention in addition to enabling the upstream flare system header to operate at a slight positive pressure at all times.
- 4.0 Exemptions
- ~~4.1~~ Flares operated in municipal solid waste landfills subject to the requirements of Rule 4642 (Solid Waste Disposal Sites) are exempt from this rule.
- ~~4.2~~ Flares that are subject to the requirements of 40 CFR 60 Subpart WWW (Standards of Performance for Municipal Waste Landfills), or Subpart Cc (Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills) are exempt from this rule.

~~4.3 Except for the recordkeeping requirements in Section 6.1.4 the requirements of this rule shall not apply to any stationary source that has the potential to emit, for all processes, less than ten (10.0) tons per year of VOC and less than ten (10.0) tons per year of NO_x.~~

4.1 Flares operated at municipal solid waste landfills that combust less than 2,000 MMscf of landfill gas per calendar year and that have ceased accepting waste.

4.2 Flares that combust only propane or butane or a combination of propane and butane.

4.3 Flares used for well testing, tank degassing, and pipeline degassing operations.

4.4 Flares that combust regeneration gas.

5.0 Requirements

The operator of any source subject to this rule shall comply with the following requirements:

5.1 Flares that are permitted to operate only during an emergency are not subject to the requirements of Sections ~~5.6 and 5.7~~, 5.8, 5.9 and 5.10.

5.2 Flares that are operated 200 hours or less per calendar year as specified in the Permit to Operate, or with an annual throughput limit equivalent to 200 hours per year at flare rating (MMBtu/hr) as specified in the Permit to Operate, are exempt from the requirements of Sections 5.9 and 5.10.

5.2.1 For the 200 hours per year validation, the operator shall use a calibrated non-resettable totalizing time meter or equivalent method approved in writing by the APCO; or

5.2.2 For the annual throughput limit equivalent to 200 hours per year validation, the operator shall use a calibrated fuel meter or equivalent method approved in writing by the APCO.

5.23 The flame shall be present at all times when combustible gases are vented through the flare.

5.34 The outlet shall be equipped with an automatic ignition system, or, shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares.

5.45 Except for flares equipped with a flow-sensing ignition system, a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an alternative equivalent device, capable of continuously detecting at least one pilot flame or the flare flame is present shall be installed and operated.

- 5.56 Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging.
- 5.67 Open flares (~~air-assisted, steam-assisted, or non-assisted~~) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. The requirements of this section shall not apply to Coanda effect flares.
- 5.78 Ground-level enclosed flares shall meet the ~~following~~ emission standards: in Table 1, except as specified in Section 5.9 and 5.10.

Table 1 – Ground Level Enclosed Flare Emissions Limits		
Type of Flare and Heat Release Rate in MMBtu/hr	VOC (lb/MMBtu)	NO _x (lb/MMBtu)
Without Steam-assist		
<10 MMBtu	0.0051	0.0952
10-100 MMBtu	0.0027	0.1330
>100 MMBtu	0.0013	0.5240
With Steam-assist		
All	0.14 as TOG	0.068

- 5.9 Except for flares that meet the emission limits specified in Table 3, operators of flares located at operations specified in Table 2 shall complete one of the following options:
 - 5.9.1 Submit an ATC application to limit flaring annual throughput through an enforceable Permit to Operate limit, to levels not to exceed those specified in Table 2 for two consecutive calendar years, per the compliance schedule in Section 7.2; or
 - 5.9.2 Replace or modify the existing flare to meet Table 3 emission limits per the compliance schedule in Section 7.3.

Table 2 – Flare Annual Throughput Thresholds (MMBtu/calendar year)	
Flare Category	MMBtu/yr
<u>A. Flares used at Oil and Gas Operations, and Chemical Operations</u>	<u>25,000</u>
<u>B. Flares used at Landfill Operations</u>	<u>90,000</u>
<u>C. Flares used at Digester Operations</u>	<u>100,000</u>
<u>D. Flares used at Organic Liquid Loading Operations</u>	<u>25,000</u>

<u>Table 3 – VOC and NOx Emissions Requirements for Flares</u>		
<u>Flare Category</u>	<u>VOC (lb/MMBtu)</u>	<u>NOx (lb/MMBtu)</u>
<u>A. Flares at Oil and Gas Operations or Chemical Operations</u>	<u>0.008</u>	<u>0.018</u>
<u>B. Flares at Landfill Operations</u>	<u>0.038</u>	<u>0.025</u>
<u>C. Flares at Digester Operations (Located at a Major Source)</u>	<u>0.038</u>	<u>0.025</u>
<u>D. Flares at Digester Operations (Not located at a Major Source)</u>	<u>N/A</u>	<u>0.060</u>
<u>E. Flares at Organic Liquid Loading Operations</u>	<u>Pounds/1,000 gallons loaded</u>	
	<u>N/A</u>	<u>0.034</u>

5.10 For operators of flares that opt to comply with Section 5.9.1, any operator with a flare that exceeds the annual throughput thresholds specified in Table 2 for two consecutive calendar years shall notify the APCO in writing of the exceedance within 30 days following the end of the second calendar year and shall replace or modify the flare to meet Table 3 emission limits per the compliance schedule in Section 7.4.

5.811 Flare Minimization Plan

Effective on and after July 1, 2011, flaring is prohibited at petroleum refineries and major sources, except landfill operations, unless it is consistent with an approved flare minimization plan (FMP), pursuant to Section 6.5, and all commitments listed in that plan have been met. This standard shall not apply if the APCO determines that the flaring is caused by an emergency as defined by Section 3.710 and is necessary to prevent an accident, hazard or release of vent gas directly to the atmosphere.

5.912 Petroleum Refinery SO₂ Performance Targets

~~5.9.1~~ ~~Effective on and after January 1, 2011, the operator of a petroleum refinery shall minimize sulfur dioxide flare emissions to less than 1.50 tons per million barrels of crude processing capacity, calculated as an average over one calendar year.~~

~~5.9.2~~ ~~Effective on and after January 1, 2017, ~~t~~The operator of a petroleum refinery shall minimize sulfur dioxide flare emissions to less than 0.50 tons per million barrels of crude processing capacity, calculated as an average over one calendar year.~~

5.103 Effective on and after July 1, 2011, the operator of a flare at a petroleum refinery or major source, except landfill operations, subject to flare minimization requirements pursuant to Section 5.811 shall monitor the vent gas flow to the flare with a flow measuring device or other parameters as specified in the Permit to Operate. The operator shall maintain records pursuant to Section 6.1.7. Flares that the operator can verify, based on permit

conditions, are not capable of producing reportable flare events pursuant to Section 6.2.2 shall not be required to monitor vent gas flow to the flare.

5.14 Effective on and after January 1, 2024, the operator of a flare subject to the annual throughput thresholds in Table 2 shall monitor the vent gas flow to the flare with a flow measuring device or other parameters as specified in the Permit to Operate. The operator shall determine the heating value (Btu per cubic foot) of the vent gas annually in accordance with Section 6.3.6. The operator shall maintain records pursuant to Section 6.1.7. Flares that the operator can verify, based on permit conditions, are not capable of exceeding the annual throughput thresholds in Table 2 shall not be required to monitor vent gas flow to the flare.

5.145 Effective on and after July 1, 2011, the operator of a petroleum refinery or a flare at a major source, except landfill operations, with a flaring capacity equal to or greater than 50 MMBtu/hr per hour shall monitor the flare pursuant to Sections 6.6, 6.7, 6.8, 6.9, and 6.10. Effective on and after January 1, 2024, the operator of any flare with a flaring capacity equal to or greater than 50 MMBtu per hour shall monitor the flare pursuant to Sections 6.6, 6.7, 6.8, 6.9, and 6.10.

6.0 Administrative Requirements

6.1 Recordkeeping

The following records shall be maintained, retained on-site for a minimum of five years, and made available to the APCO, ARB, and EPA upon request:

6.1.1 Copy of the compliance determination conducted pursuant to Section 6.4.1.

6.1.2 Copy of the source testing result conducted pursuant to Section 6.4.2.

6.1.3 For flares used during an emergency, record of the duration of flare operation, amount of gas burned, and the nature of the emergency situation.

6.1.4 Operators claiming an exemption pursuant to Section ~~4.35.2~~ shall record annual hours of operation or annual throughput, ~~material usage, or other information~~ necessary to demonstrate an exemption under that section.

6.1.5 ~~Effective on and after July 1, 2011, a~~ copy of the approved flare minimization plan pursuant to Section 6.5.

6.1.6 ~~Effective on and after July 1, 2012, where applicable, a~~ copy of annual reports submitted to the APCO pursuant to Section 6.2.

6.1.7 ~~Effective on and after July 1, 2011, where applicable, m~~Monitoring data collected pursuant to Sections ~~5.103, 5.14,~~ 6.6, 6.7, 6.8, 6.9, and 6.10.

6.2 Flare Reporting

6.2.1 Unplanned Flaring Event

~~Effective on and after July 1, 2011, the~~ operator of a flare subject to flare minimization plans pursuant to Section 5.811 of this rule shall notify the APCO of an unplanned flaring event within 24 hours after the start of the next business day or within 24 hours of their discovery, whichever occurs first. The notification shall include the flare source identification, the start date and time, and the end date and time.

6.2.2 Reportable Flaring Event

Effective on and after July 1, 2012, and annually thereafter, except for flares meeting the emission limits in Table 3, the operator of a flare subject to flare minimization plans pursuant to Section 5.811 shall submit an annual report to the APCO that summarizes all Reportable Flaring Events as defined in Section 3.0 that occurred during the previous 12 month period. Beginning January 1, 2024, ~~the~~ report shall be submitted within 30 days following the end of the previous calendar year ~~twelve month period of the previous year~~. The report shall include, but is not limited to all of the following:

6.2.2.1 The results of an investigation to determine the primary cause and contributing factors of the flaring event;

6.2.2.2 Any prevention measures considered or implemented to prevent recurrence together with a justification for rejecting any measures that were considered but not implemented;

6.2.2.3 If appropriate, an explanation of why the flaring was an emergency and necessary to prevent accident, hazard or release of vent gas to the atmosphere, or where, due to a regulatory mandate to vent a flare, it cannot be recovered, treated and used as a fuel gas at the facility; and

6.2.2.4 The date, time, and duration of the flaring event.

6.2.3 Annual Monitoring Report

~~Effective on and after July 1, 2012, and annually thereafter,~~ Until January 1, 2024, the operator of a flare at a petroleum refinery or major source, except landfill operations, subject to flare monitoring requirements pursuant to Sections 5.103, 5.14, 6.6, 6.7, 6.8, 6.9, and 6.10, as appropriate, shall submit an annual report to the APCO within 30 days following the end of each 12 month period.

Effective on and after January 1, 2024, and annually thereafter, the operator of a any flare subject to flare monitoring requirements pursuant to Sections 5.13,

5.14, 6.6, 6.7, 6.8, 6.9, and 6.10, as appropriate, shall submit an annual report in an electronic format approved by the District to the APCO within 30 days following the end of each calendar year for all required monitoring under those sections.

The report shall include the following:

- 6.2.3.1 The total volumetric flow of vent gas in standard cubic feet for each day for the previous calendar year.
- 6.2.3.2 Hydrogen sulfide content, methane content, and hydrocarbon content of vent gas composition, where applicable pursuant to Section 6.6.
- 6.2.3.3 If vent gas composition is monitored by a continuous analyzer or analyzers pursuant to Section 5.144, average total hydrocarbon content by volume, average methane content by volume, and depending upon the analytical method used pursuant to Section 6.3.4, total reduced sulfur content by volume or hydrogen sulfide content by volume of vent gas flared for each hour of the month.
- 6.2.3.4 If the flow monitor used pursuant to Section 5.103 measures molecular weight, the average molecular weight for each hour of each month.
- 6.2.3.5 For any pilot and purge gas used, the type of gas used, the volumetric flow for each day and for each month, and the means used to determine flow, as applicable pursuant to Section 6.7.
- 6.2.3.6 Flare monitoring system downtime periods, including dates and times, as applicable pursuant to Section 6.9.
- 6.2.3.7 For each day and for each month provide calculated sulfur dioxide emissions, as applicable.
- 6.2.3.8 A flow verification report for each flare subject to this rule. The flow verification report shall include flow verification testing pursuant to Section 6.3.5.
- 6.2.3.9 For flares subject to the annual throughput thresholds specified in Table 2, include the annual throughput in MMBtu for the previous calendar year.

6.3 Test Methods

The test methods listed below shall be used to demonstrate compliance with this rule. Alternate equivalent test methods may be used provided the test methods have been approved by the APCO and EPA.

- 6.3.1 VOC, measured and calculated as carbon, shall be determined by EPA Method 25, except when the outlet concentration must be below 50 ppm in order to meet the standard, in which case Method 25a may be used, and analysis of halogenated exempt compounds shall be analyzed by EPA Method 18 or ARB Method 422 “Determination of Volatile organic Compounds in Emission from Stationary Sources”. The VOC concentration in ppmv shall be converted to pounds per million Btu (lb/MMBtu) by using the following equation:

$$\text{VOC in lb/MMBtu} = \frac{(\text{ppmv dry}) \times (F, \text{dscf} / \text{MMBtu})}{(1.135 \times 10^6) \times (20.9 - \%O_2)}$$

Where: F = As determined by EPA Method 19

- 6.3.2 NOx emissions in pounds per million BTU shall be determined by using EPA Method 19.
- 6.3.3 NOx and O₂ concentrations shall be determined by using EPA Method 3A, EPA Method 7E, or ARB 100.
- 6.3.4 Testing and Sampling Methods for Flare Monitoring

Effective on and after July 1, 2011 operators subject to vent gas composition monitoring requirements pursuant to Section 6.6 shall use the following test methods as appropriate, or by an alternative method approved by the APCO, ARB and EPA:

- 6.3.4.1 Total hydrocarbon content and methane content of vent gas shall be determined using ASTM Method D 1945-96, ASTM Method UOP 539-97, EPA Method 18, or EPA Method 25A or 25B,
- 6.3.4.2 Hydrogen sulfide content of vent gas shall be determined using ASTM Method D 1945-96, ASTM Method UOP 539-97, ASTM Method D 4084-94, or ASTM Method D 4810-88.
- 6.3.4.3 If vent gas composition is monitored with a continuous analyzer employing gas chromatography the minimum sampling frequency shall be one sample every 30 minutes.
- 6.3.4.4 If vent gas composition is monitored using continuous analyzers not employing gas chromatography, the total reduced sulfur content of vent gas shall be determined by using EPA Method D4468-85.

6.3.5 Flow Verification Test Methods

For purposes of the flow verification report required by Section 6.2.3.8, vent gas flow shall be determined using one or more of the following methods, or by any alternative method approved by the APCO, ARB, and EPA:

6.3.5.1 EPA Methods 1 and 2;

6.3.5.2 A verification method recommended by the manufacturer of the flow monitoring equipment installed pursuant to Section 5.103.

6.3.5.3 Tracer gas dilution or velocity.

6.3.5.4 Other flow monitors or process monitors that can provide comparison data on a vent stream that is being directed past the ultrasonic flow meter.

6.3.6 The heating value of flare gas shall be determined by ASTM D 1826-88 or ASTM D 1945-81 in conjunction with ASTM D 3588-89; alternately, an operator may elect to use a default heating value from Table 4.

<u>Table 4 – Default Flare Gas Heating Values</u>	
<u>Flare Category</u>	<u>Heating Value (Btu/scf)</u>
<u>Flares at Oil and Gas Operations or Chemical Operations</u>	<u>1,000</u>
<u>Flares at Landfill Operations</u>	<u>500</u>
<u>Flares at Digester Operations</u>	<u>600</u>

6.4 Compliance Determination

6.4.1 Upon request, the operator of flares that are subject to Section 5.67 shall make available, to the APCO, the compliance determination records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5).

6.4.2 The operator of ~~ground-level enclosed~~ flares subject to emission limits in Table 1 and Table 3, Categories A, B, and C shall conduct source testing at least once every 12 months to demonstrate compliance with Section 5.78. The operator shall submit a copy of the testing protocol to the APCO at least 30 days in advance of the scheduled testing. The operator shall submit the source test results not later than ~~45~~ 60 days after completion of the source testing.

6.5 Flare Minimization Plan

6.5.1 By July 1, 2010, the operator of a petroleum refinery flare or any flare at a major source, except landfill operations, that has a flaring capacity of greater than or

equal to 5.0 MMBtu per hour shall submit a flare minimization plan (FMP) to the APCO for approval.

The FMP shall include, but not be limited to:

- 6.5.1.1 A description and technical specifications for each flare and associated knock-out pots, surge drums, water seals and flare gas recovery systems.
 - 6.5.1.2 Detailed process flow diagrams of all upstream equipment and process units venting to each flare, identifying the type and location of all control equipment.
 - 6.5.1.3 A description of equipment, processes, or procedures the operator plans to install or implement to eliminate or minimize flaring and planned date of installation or implementation.
 - 6.5.1.4 An evaluation of prevention measures to reduce flaring that has occurred or may be expected to occur during planned major maintenance activities, including startup and shutdown.
 - 6.5.1.5 An evaluation of preventative measures to reduce flaring that may be expected to occur due to issues of gas quantity and quality. The evaluation shall include an audit of the vent gas recovery capacity of each flare system, the storage capacity available for excess vent gases, and the scrubbing capacity available for vent gases including any limitations associated with scrubbing vent gases for use as a fuel; and shall determine the feasibility of reducing flaring through the recovery, treatment and use of the gas or other means.
 - 6.5.1.6 An evaluation of preventative measures to reduce flaring caused by the recurrent failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. The evaluation shall determine the adequacy of existing maintenance schedules and protocols for such equipment. For purposes of this section, a failure is recurrent if it occurs more than twice during any five year period as a result of the same cause as identified in accordance with Section 6.2.2.
 - 6.5.1.7 Any other information requested by the APCO as necessary for determination of compliance with applicable provisions of this rule.
- 6.5.2 Every five years after the initial FMP submittal, the operator shall submit an updated FMP for each flare to the APCO for approval. The current FMP shall remain in effect until the updated FMP is approved by the APCO. If the operator fails to submit an updated FMP as required by this section, the existing FMP shall no longer be considered an approved plan.

- 6.5.3 An updated FMP shall be submitted by the operator pursuant to Section 6.5 addressing new or modified equipment, prior to installing the equipment. Updated FMP submittals are only required if:
- 6.5.3.1 The equipment change would require an authority to construct (ATC) and would impact the emissions from the flare, and
 - ~~6.5.3.2 The ATC is deemed complete after June 18, 2009, and~~
 - 6.5.3.3~~2~~ The modification is not solely the removal or decommissioning of equipment that is listed in the FMP, and has no associated increase in flare emissions.
- 6.5.4 When submitting the initial FMP, or updated FMP, the operator shall designate as confidential any information claimed to be exempt from public disclosure under the California Public Records Act, Government Code Section 6250 et seq. If a document is submitted that contains information designated confidential, the operator shall provide a justification for this designation and shall submit a separate copy of the document with the information designated confidential redacted.

6.6 Vent Gas Composition Monitoring

Effective on and after July 1, 2011, the operator of a petroleum refinery flare or any flare at a major source, except landfill operations, that has a flaring capacity equal to or greater than 50 MMBtu per hour shall monitor vent gas composition using one of the five methods pursuant to Section 6.6.1 through Section 6.6.5, as appropriate.

Effective on and after January 1, 2024, the operator of any flare with a flaring capacity equal to or greater than 50 MMBtu per hour, except landfill operations, shall monitor vent gas composition using one of the five methods pursuant to Section 6.6.1 through Section 6.6.5, as appropriate.

6.6.1 Sampling that meets the following requirements:

- 6.6.1.1 If the flow rate of vent gas flared in any consecutive 15-minute period continuously exceeds 330 standard cubic feet per minute (SCFM), a sample shall be taken within 15 minutes. The sampling frequency thereafter shall be one sample every three hours and shall continue until the flow rate of vent gas flared in any consecutive 15-minute period is continuously 330 SCFM or less. In no case shall a sample be required more frequently than once every 3 hours.
- 6.6.1.2 Samples shall be analyzed pursuant to Section 6.3.4.

- 6.6.2 Integrated sampling that meets the following requirements:
 - 6.6.2.1 If the flow rate of vent gas flared in any consecutive 15 minute period continuously exceeds 330 SCFM, integrated sampling shall begin within 15 minutes and shall continue until the flow rate of vent gas flared in any consecutive 15 minute period is continuously 330 SCFM or less.
 - 6.6.2.2 Integrated sampling shall consist of a minimum of one aliquot for each 15-minute period until the sample container is full. If sampling is still required pursuant to Section 6.6.2.1, a new sample container shall be placed in service within one hour after the previous sample was filled. A sample container shall not be used for a sampling period that exceeds 24 hours.
 - 6.6.2.3 Samples shall be analyzed pursuant to Section 6.3.4.
- 6.6.3 Continuous analyzers that meet the following requirements:
 - 6.6.3.1 The analyzers shall continuously monitor for total hydrocarbon methane, and depending upon the analytical method used pursuant to Section 6.3.4, hydrogen sulfide or total reduced sulfur.
 - 6.6.3.2 The hydrocarbon analyzer shall have a full-scale range of 100% total hydrocarbon.
 - 6.6.3.3 Each analyzer shall be maintained to be accurate to within 20% when compared to any field accuracy tests or to within 5% of full scale.
- 6.6.4 Continuous analyzers employing gas chromatography that meet the following requirements:
 - 6.6.4.1 The gas chromatography system shall monitor for total hydrocarbon, methane, and hydrogen sulfide.
 - 6.6.4.2 The gas chromatography system shall be maintained to be accurate within 5% of full scale.
- 6.6.5 Monitor sulfur content using a colorimetric tube system on a daily basis, and monitor vent gas hydrocarbon on a weekly basis by collecting samples and having them tested pursuant to a method in Section 6.3.4.
- 6.6.6 If flares share a common header, a sample from the header will be deemed representative of vent gas composition for all flares served by the header.

6.6.7 The operator shall provide the APCO with access to the monitoring system to collect vent gas samples to verify the analysis required by Section 5.144.

6.7 Pilot and Purge Gas Monitoring

Effective on and after July 1, 2011, the operator of a petroleum refinery flare or any flare at a major source, except landfill operations, that has a flaring capacity equal to or greater than 50 MMBtu per hour shall monitor the volumetric flows of purge and pilot gases with flow measuring devices or other parameters as specified on the Permit to Operate so that volumetric flows of pilot and purge gas may be calculated based on pilot design and the parameters monitored.

Effective on and after January 1, 2024, the operator of any flare that has a flaring capacity equal to or greater than 50 MMBtu per hour shall monitor the volumetric flows of purge and pilot gases with flow measuring devices or other parameters as specified on the Permit to Operate so that volumetric flows of pilot and purge gas may be calculated based on pilot design and the parameters monitored.

6.8 Water Seal Monitoring

Effective on and after July 1, 2011, the operator of a petroleum refinery flare or any flare at a major source, except landfill operations, that has a flaring capacity equal to or greater than 50 MMBtu per hour with a water seal shall monitor and record the water level and pressure of the water seal that services each flare daily or as specified on the Permit to Operate.

Effective on and after January 1, 2024, the operator of any flare that has a flaring capacity equal to or greater than 50 MMBtu per hour with a water seal shall monitor and record the water level and pressure of the water seal that services each flare daily or as specified on the Permit to Operate.

6.9 General Monitoring

Effective on and after July 1, 2011, the operator of a petroleum refinery flare or any flare at a major source, except landfill operations, that has a flaring capacity equal to or greater than 50 MMBtu per hour shall comply with the ~~following~~ below sections, as applicable.

Effective on and after January 1, 2024, the operator of any flare with a flaring capacity equal to or greater than 50 MMBtu per hour shall also comply with the below sections, as applicable.

6.9.1 Periods of flare monitoring system inoperation greater than 24 continuous hours shall be reported by the following working day, followed by notification of resumption of monitoring. Periods of inoperation of monitoring equipment shall not exceed 14 days per any 18-consecutive-month period. Periods of flare

monitoring system inoperation do not include the periods when the system feeding the flare is not operating.

- 6.9.2 During periods of inoperation of continuous analyzers or auto-samplers installed pursuant to Section 6.6, operators responsible for monitoring shall take one sample within 30 minutes of the commencement of flaring, from the flare header or from an alternate location at which samples are representative of vent gas composition and have samples analyzed pursuant to Section 6.3.4. During periods of inoperation of flow monitors required by Section 5.10~~3~~, flow shall be calculated using good engineering practices.
- 6.9.3 Maintain and calibrate all required monitors and recording devices in accordance with the applicable manufacturer's specifications. In order to claim that a manufacturer's specification is not applicable, the person responsible for emissions must have, and follow, a written maintenance policy that was developed for the device in question. The written policy must explain and justify the difference between the written procedure and the manufacturer's procedure.
- 6.9.4 All in-line continuous analyzer and flow monitoring data must be continuously recorded by an electronic data acquisition system capable of one-minute averages. Flow monitoring data shall be recorded as one-minute averages.

6.10 Video Monitoring

~~Effective on and after July 1, 2011,~~ The operator of a petroleum refinery flare shall install and maintain equipment that records a real-time digital image of the flare and flame at a frame rate of no less than one frame per minute. The recorded image of the flare shall be of sufficient size, contrast, and resolution to be readily apparent in the overall image or frame. The image shall include an embedded date and time stamp. The equipment shall archive the images for each 24-hour period. In lieu of video monitoring the operator may use an alternative monitoring method that provides data to verify date, time, vent gas flow, and duration of flaring events.

7.0 Compliance Schedule

- 7.1 Operators of flares, that are exempt under Section 4.0 and that lose exemption status, shall not operate flares until in full compliance with all applicable requirements of this rule effective on the date the exemption status is lost.

7.2 Operators of flares opting to limit flaring annual throughput per Section 5.9.1 shall meet the compliance schedule in Table 5.

<u>Table 5 – Flaring Throughput Permit to Operate Limit Timeline</u>	
<u>Requirement</u>	<u>Deadline</u>
A. <u>Submit ATC application to limit annual throughput to levels below those specified in Table 2</u>	<u>July 1, 2022</u>
B. <u>Compliance with flaring annual throughput limits</u>	<u>On and after January 1, 2024</u>

7.3 Operators of flares opting to replace or modify a flare to meet the emission limits in Table 3 per Section 5.9.2 shall meet the compliance schedule in Table 6.

<u>Table 6 – Flare Modification or Replacement Timeline</u>	
<u>Requirement</u>	<u>Deadline</u>
A. <u>Submit ATC application to modify or replace the flare to meet Table 3 emission limits</u>	<u>July 1, 2022</u>
B. <u>Demonstrate Compliance with Table 3 emission limits</u>	<u>December 31, 2023</u>

7.4 Operators of flares subject to Section 5.10 shall meet the compliance schedule in Table 7.

<u>Table 7 – Flare Modification or Replacement Timeline</u>	
<u>Requirement</u>	<u>Deadline</u>
A. <u>Submit ATC application to modify or replace the flare to meet Table 3 emission limits</u>	<u>By March 1 of the year after the end of the second consecutive calendar year in which an exceedance of the Annual Throughput Threshold occurred</u>
B. <u>Demonstrate Compliance with Table 3 emission limits</u>	<u>By December 31 of the year after the end of the second consecutive calendar year in which an exceedance of the Annual Throughput Threshold occurred</u>

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