

SUBCHAPTER H: HIGHLY-REACTIVE VOLATILE ORGANIC COMPOUNDS
DIVISION 1: VENT GAS CONTROL
§§115.720, 115.722, 115.725 - 115.727, 115.729
Effective December 23, 2004

§115.720. Applicability and Definitions.

(a) **Applicability.** In the Houston/Galveston/Brazoria area, as defined in §115.10 of this title (relating to Definitions), any site with a controlled or uncontrolled vent gas stream containing highly-reactive volatile organic compounds (HRVOC), as defined in §115.10 of this title, or a flare that emits or has the potential to emit HRVOC is subject to this division (relating to Vent Gas Control) in addition to the applicable requirements of Subchapter B, Divisions 2 and 6 of this chapter (relating to Vent Gas Control; and Batch Processes) and Subchapter D, Division 1 of this chapter (relating to Process Unit Turnaround and Vacuum-Producing Systems in Petroleum Refineries).

(b) **Definitions.** The following terms, when used in this division, have the following meanings, unless the context clearly indicates otherwise. Additional definitions for terms used in this division are found in §§3.2, 101.1, and 115.10 of this title (relating to Definitions).

(1) **Degassing safety device** - A device other than a flare used to prevent the release of unburned organic vapors from a geologic storage facility resulting from either equipment or containment failure.

(2) **Supplementary fuel** - Natural gas or fuel gas added to the gas stream to increase the net heating value.

(3) **Pilot gas** - Natural gas or fuel gas that does not contain greater than 5% by weight highly-reactive volatile organic compounds that is directed to the combustion point of a flare to maintain a continuous ignition source.

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§115.722. Site-wide Cap and Control Requirements.

(a) The owner or operator of a site subject to this division shall additionally comply with the requirements of Chapter 101, Subchapter H, Division 6 of this title (relating to Highly-Responsive Volatile Organic Compound Emissions Cap and Trade Program).

(b) All sites subject to this division or Division 2 of this subchapter (relating to Cooling Tower Heat Exchange Systems) that are exempt from the highly-reactive volatile organic compound (HRVOC) emissions cap and trade program, in accordance with §101.392(a) of this title (relating to Exemptions), are limited to ten tons of HRVOC emissions per calendar year.

(c) Each site subject to this division is subject to the following emission limitations.

(1) HRVOC emissions at each site located in Harris County that is subject to this division or Division 2 of this subchapter must not exceed 1,200 pounds of HRVOC per one-hour block period from any flare, vent, pressure relief valve, cooling tower, or any combination.

(2) HRVOC emissions at each site located in the Houston/Galveston/Brazoria area as defined in §115.10 of this title (relating to Definitions), excluding Harris County, that is subject to this division or Division 2 of this subchapter must not exceed 1,200 pounds of HRVOC per one-hour block period from any flare, vent, pressure relief valve, cooling tower, or any combination.

(3) For any exceedance of the HRVOC emission limits specified in paragraph (1) or (2) of this subsection, the emission limits specified in paragraph (1) or (2) of this subsection must be used to determine compliance with subsection (a) or (b) of this section instead of the total amount of actual emissions.

(d) All flares must continuously meet the requirements of 40 Code of Federal Regulations §60.18(c)(2) - (6) and (d) as amended through October 17, 2000 (65 FR 61744) when vent gas containing HRVOC is being routed to the flare.

(1) Average net heating value over a one-hour block period will be used to demonstrate compliance with the minimum net heating value requirements.

(2) The exit velocity averaged over a one-hour block period must be used to demonstrate compliance with the maximum exit velocity requirements.

(e) An owner or operator may not use emission reduction credits or discrete emission reduction credits in order to demonstrate compliance with this division.

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§115.725. Monitoring and Testing Requirements.

(a) Except for pressure relief valves as defined in §115.10 of this title (relating to Definitions), each vent gas stream that is not controlled by a flare at a site must be tested by applying the appropriate reference method tests and procedures specified in §115.125 of this title (relating to Testing Requirements) to establish maximum potential highly-reactive volatile organic compound (HRVOC) hourly emission data expected during any operation not defined as an emissions event or a scheduled maintenance, startup, or shutdown activity under §101.1 of this title (relating to Definitions). The data shall be used in accordance with the test plan required under §115.726 of this title (relating to Recordkeeping and Reporting Requirements) to demonstrate compliance with the control requirement of §115.722(a) - (c) of this title (relating to Site-wide Cap and Control Requirements). For cyclic or batch processes, the HRVOC emissions shall be considered as zero during non-operational periods other than startup, shutdown, or maintenance activities.

(1) For each uncontrolled vent subject to the requirements of this subsection, the owner or operator shall:

(A) select an operational parameter or parameters that directly affects the HRVOC emissions from the vent;

(B) install, calibrate, maintain, and operate according to manufacturer's recommendations, a continuous monitoring system to monitor and record the parameter or parameters selected under subparagraph (A) of this paragraph; and

(C) establish operating limits for the selected parameter or parameters as the hourly average of the parameter or parameters during the HRVOC emission test required under this subsection.

(2) For each vent subject to the requirements of this subsection that is controlled by a control device other than a flare, the owner or operator shall:

(A) select an operational parameter or parameters that directly affects the HRVOC emissions directed to the control device;

(B) select an operational parameter or parameters of the control device that directly affects the control efficiency of the control device;

(C) install, calibrate, maintain, and operate according to manufacturer recommendations, continuous monitoring systems to monitor and record the parameters selected under subparagraphs (A) and (B) of this paragraph; and

(D) establish operating limits for the selected parameters required under subparagraphs (A) and (B) of this paragraph as the hourly averages of the parameters during the HRVOC emission test required under this subsection.

(3) To demonstrate compliance with the control requirements of §115.722(a) - (c) of this title during emission events and scheduled startup, shutdown, and maintenance activities, the owner or operator shall determine the HRVOC emissions from each vent using one of the following:

(A) testing using the appropriate reference methods and procedures specified in this section; or

(B) process knowledge and engineering calculations. If process knowledge and engineering calculations are used to determine HRVOC emissions during emission events and scheduled startup, shutdown, and maintenance activities, the monitoring plans required under paragraph (4) of this subsection must also include all process information and calculations used to calculate the HRVOC emissions.

(4) The owner or operator shall develop, implement, and follow a written monitoring plan for the continuous monitoring systems required in paragraphs (1) and (2) of this subsection prior to performing the monitoring and testing under this subsection. Upon written request by the executive director, the monitoring plans shall be submitted within 30 days for review. The executive director

may require additional or alternative monitoring requirements. At a minimum, monitoring plans shall include:

- (A) specifications for all monitors used in the continuous monitoring systems;
- (B) process and control device information supporting the selection of parameters;
- (C) actual testing or manufacturer data documenting the control efficiency of the control device; and
- (D) schedule of quarterly inspections of the continuous monitoring systems to insure proper operation.

(5) After the initial HRVOC emission test required under this subsection, the owner or operator may perform additional emission testing to update the data used to demonstrate compliance with the control requirements of §115.722(a) - (c) of this title. Written notification of the testing must be submitted to the Houston Regional Office as specified in §115.726(a)(2) of this title.

(6) Testing using the appropriate reference methods and procedures specified in §115.125 of this title that was conducted prior to December 31, 2004, may be used in lieu of conducting the testing specified in this subsection, provided that:

(A) the owner or operator of the affected source obtains approval for the testing report and data from the executive director if the prior testing was not performed as a demonstration of compliance with an applicable state permit, other state rule, or federal regulation, and the test report submitted to the commission; and

(B) the testing establishes maximum potential HRVOC emissions data expected during any operation that is not defined as an emissions event or a scheduled maintenance, startup, or shutdown activity under §101.1 of this title.

(C) the operational parameters selected as required under paragraphs (1) or (2) of this subsection were monitored at the time of testing with a monitoring system meeting the requirements of this subsection or an equivalent monitoring system. If the prior testing meets all provisions under this paragraph and is used to satisfy the testing requirement of this subsection, then the owner or operator shall comply with the monitoring system and written monitoring plan requirements of this subsection by no later than the compliance schedule in §115.729 of this title (relating to Counties and Compliance Schedules) instead of the time required in paragraph (4) of this subsection.

(7) The executive director may waive testing for no more than one-half of the vents that are identical in design and operation if the owner or operator demonstrates that all the vents are identical in design and operation, and the emissions from all of the vents can be expected to be identical.

(A) The request for a waiver shall be submitted with the test plan required under §115.726(a) of this title. Information required to support the waiver request shall include, but is not limited to, the following:

- (i) identification of each vent expected to be identical;
- (ii) each specific vent to be tested;
- (iii) a detailed technical explanation demonstrating that the measured emissions from the selected vents can be expected to be representative of emissions from all vents;
- (iv) specific technical information for each vent and the process associated with each vent demonstrating that the vents and associated processes are identical in design and operation;
- (v) maintenance records for each vent and associated process demonstrating the vents and associated processes have been maintained in a similar manner; and
- (vi) any additional information or data requested by the executive director necessary to demonstrate that the emissions from the vents can be expected to be identical.

(B) The executive director shall review the request for waiver and may provide a temporary waiver authorizing testing of no more than one-half of the vents. The results of the tests must be submitted to the executive director no later than 60 days after completion of testing. The executive director will determine if any further testing is required based on the review of the test results. If further testing is required, the owner or operator must perform the additional testing no later than 60 days after receiving written notification from the executive director.

(C) To demonstrate compliance with the control requirements of §115.722(a) - (c) of this title, the HRVOC emission test results from the vent gas stream with the maximum HRVOC emission rate of those vents tested under this paragraph must be used for those vent gas streams for which a waiver of testing, temporary or permanent, has been authorized.

(b) The following alternatives may be used in lieu of the testing requirements of subsection (a) of this section, for vent gas streams that are not controlled by a flare or are not pressure relief valves. The vent gas stream must comply with the process parameter monitoring requirements of subsection (a) of this section, except as specified in paragraph (1)(D) of this subsection.

(1) The vent gas stream may be equipped with a continuous emissions monitoring system (CEMS), provided that:

(A) the CEMS meets the monitoring requirements of 40 Code of Federal Regulations (CFR) §60.13(b) and (d) - (f);

(B) the monitor shall initially and at a minimum quarterly thereafter be subjected to a cylinder gas audit per 40 CFR Part 60, Appendix B, Performance Specification 2, Section 16 to assess system bias and ensure accuracy;

(C) the measured concentration shall be used in combination with flow rate determined in accordance with subparagraph (D) of this paragraph to determine the hourly HRVOC emission rate;

(D) the following parameter monitoring requirements are used in lieu of the requirements of subsection (a)(1) or (2) of this section:

(i) the owner or operator must install, calibrate, maintain, and operate according to manufacturer's recommendations, a continuous monitoring system on the vent or in the associated process systems sufficient to determine the volumetric flow; and

(ii) if volumetric flow rate is not monitored directly, the owner or operator must determine through engineering calculations, manufacturer's information, or actual testing the correlation between the monitored parameter and the volumetric flow rate; and

(E) the owner or operator complies with the requirements for a written monitoring plan specified in subsection (a)(4) of this section.

(2) Process knowledge, including scientific calculations and other process monitoring data sufficient to demonstrate compliance status, may be used to determine maximum potential HRVOC hourly emission data. Types of vent gas streams for which process knowledge may be used in lieu of testing are:

(A) analyzer vents;

(B) steam system vents;

(C) vent gas streams where there is no HRVOC present except during emissions events; or

(D) degassing safety devices, as defined in §115.720 of this title (relating to Applicability and Definitions).

(c) Affected pressure relief valves not controlled by a flare shall be monitored as follows.

(1) Install, calibrate, maintain, and operate according to manufacturer's recommendations, a continuous monitoring system on the pressure relief valve or in the associated process systems sufficient to determine:

(A) the time and duration of each pressure relief event;

(B) the status of the pressure relief valve as either:

(i) open or closed to the atmosphere; or

(ii) the percentage the valve is open to the atmosphere; and

(C) the volumetric flow rate during a pressure relief event.

(i) If volumetric flow rate is not monitored directly, the owner or operator must determine through engineering calculations, manufacturer's information, or actual testing the correlation between the monitored parameter and the percentage the pressure relief valve is open to the atmosphere to the volumetric flow rate.

(ii) If the monitoring system only indicates an open or closed status as specified in subparagraph (B)(i) of this paragraph, the owner or operator must assume the pressure relief valve is 100% open during a pressure relief event for purposes of calculating volumetric flow rate.

(2) For purposes of determining compliance with the control requirement of §115.722(a) - (c) of this title during pressure relief events, the owner or operator may use process knowledge, including scientific calculations and other process monitoring data, to determine HRVOC emission rates. The volumetric flow rate determined in accordance with paragraph (1)(C) of this subsection shall be used in combination with the process knowledge to determine HRVOC emission rates.

(3) The owner or operator shall develop, implement, and follow a written monitoring plan to satisfy the requirements of paragraphs (1) and (2) of this subsection. The monitoring plan must include:

(A) specifications for all monitors used to satisfy the requirements of paragraphs (1) and (2) of this subsection;

(B) all engineering calculations, manufacturer's information, or actual testing supporting the correlation of the monitored parameters to actual volumetric flow rate specified in paragraph (1)(C)(i) of this subsection;

(C) supporting documentation of the actual testing or process knowledge used to determine HRVOC emissions as provided in paragraph (2) of this subsection;

(D) at a minimum, quarterly inspections of all pressure relief valves and associated monitors to insure proper operation per the manufacturer's specifications; and

(E) a list identifying all pressure relief valves in HRVOC service subject to the requirements of this subsection.

(4) Upon written request by the executive director, the monitoring plan required under paragraph (3) of this subsection must be submitted within 30 days for review. The executive director may require additional or alternative monitoring requirements.

(d) Except as specified in subsections (e) - (k) of this section, the owner or operator of an affected flare must conduct continuous monitoring, to demonstrate compliance with §115.722(a) - (d) of this title as follows:

(1) install, calibrate, maintain, and operate a continuous flow monitoring system capable of measuring the flow rate over the full potential range of operation. The executive director may approve alternative means of determining the flare flow rate for a period of time not to exceed 1.0% of the annual operating time of the flare. The monitoring system must be capable of measuring the entire gas stream flow to the flare (i.e., all vent gas and supplemental fuel sources) and may consist of one or more flow measurements at one or more header locations. For correcting flow rate to standard conditions (defined as 68 degrees Fahrenheit and 760 millimeters of mercury (mm Hg)), temperature and pressure in the main flare header must be monitored continuously. The monitors must be calibrated to meet accuracy specifications as follows:

(A) the temperature monitor must be calibrated annually to within $\pm 2.0\%$ at absolute temperature;

(B) the pressure monitor must be calibrated annually to within ± 5.0 mm Hg;
and

(C) the flow monitor, or velocity monitor used to determine flow rate, must be initially calibrated, prior to installation, to demonstrate accuracy to within 5.0% at flow rates equivalent to 30%, 60%, and 90% of monitor full scale. After installation, the flow monitor or velocity monitor must be calibrated annually according to manufacturer's specifications;

(2) install, calibrate, maintain, and operate an on-line analyzer system capable of determining HRVOC at least once every 15 minutes. The on-line analyzer system must also be capable of measuring, at least once every 15 minutes, other potential constituents (e.g., hydrogen, nitrogen, methane, and carbon dioxide, and volatile organic compounds (VOC) other than HRVOCs) sufficient to determine the molecular weight and net heating value of the gas combusted in the flare to within 5.0%. Samples must be collected from a location on the main flare header such that the measured constituents, including any supplementary fuel, are representative of the combined gas combusted in the flare system. Net heating value of the gas combusted in the flare must be calculated according to the equation given in 40 CFR §60.18(f)(3) as amended through October 17, 2000 (65 FR 61744). The samples must be used to demonstrate continuous compliance with the requirements of §115.722(a) - (d) of this title. Pilot gas may not be included in the determination of the net heating value.

(A) Calibration of the on-line analyzer shall be as follows:

(i) for the HRVOC constituents, follow the procedures and requirements of Section 10.0 of 40 CFR Part 60, Appendix B, Performance Specification 9, as

amended through October 17, 2000 (65 FR 61744), except that the multi-point calibration procedure in Section 10.1 of Performance Specification 9 must be performed at least once every calendar quarter instead of once every month, and the mid-level calibration check procedure in Section 10.2 of Performance Specification 9 must be performed at least once every calendar week instead of once every 24 hours. The calibration gases used for calibration procedures must be in accordance with Section 7.1 of Performance Specification 9;

(ii) for the constituents monitored to determine net heating value and molecular weight, the owner or operator may elect to follow either the calibration procedures specified for HRVOC constituents in clause (i) of this subparagraph or the calibration procedures recommended by the analyzer manufacturer. If the owner or operator elects to follow manufacturer's recommended procedures:

(I) those calibration procedures must include, at a minimum, single point calibration checks at least once every calendar week to meet the acceptance criteria specified in Section 10.2 of Performance Specification 9 with certified standards of the top two non-HRVOC constituents affecting molecular weight and net heating value; and

(II) the owner or operator shall include in the quality assurance plan (QAP) required under §115.726(a) of this title, manufacturer's information and data to demonstrate the accuracy and reliability of the analyzer for those monitored constituents for which routine calibration checks are not performed;

(iii) the range of calibration standards for the HRVOCs and other constituents may be based on the typical concentrations observed rather than the full potential range of concentrations. Data must be included in the QAP required under §115.726(a) of this title to demonstrate the accuracy of the analyzer at maximum potential concentrations outside of the proposed calibration range; and

(iv) the executive director may specify additional calibration requirements during approval of the QAP under §115.726(a)(1)(B) of this title.

(B) If the on-line analyzer, required in this paragraph, measures concentrations on a dry basis, the results must be corrected for moisture when determining net heating value according to the requirements in 40 CFR §60.18(f)(3) or when determining mass rates using volumetric flow rates that are on a wet basis. The following methods may be used to determine moisture for this correction:

(i) a continuous moisture analyzer installed, calibrated, maintained, and operated according to the manufacturer's recommendations;

(ii) assume saturated moisture conditions for the temperature and pressure at the sample extraction point in the flare header for conditions up to 20% moisture by volume;

(iii) assume 0% moisture for flare systems where moisture is not expected to be present due to the process nature of the vent streams routed to the flare; or

(iv) process information and engineering calculations for conditions, such as steaming operations, where moisture is expected to be greater than 20% by volume;

(3) continuously operate each monitoring system as required by this section at least 95% of the time when the flare is operational, averaged over a calendar year. The percent measurement data availability must be calculated as the total flare operating hours for which valid quality-assured data was recorded divided by the total flare operating hours. Time required for normal calibration checks required under paragraphs (1) and (2) of this subsection is not considered downtime for purposes of this calculation;

(4) during any period of monitor downtime of the on-line analyzer specified in paragraph (2) of this subsection exceeding eight consecutive hours, take a sample daily, starting within ten hours of the initial on-line analyzer malfunction. The sampling location must be such that the measured constituents, including any supplementary fuel, is representative of all of the major constituents going to the flare system. For determining the HRVOC concentrations in the flare header gas, the samples must be analyzed for the concentrations of HRVOC according to the procedures in 40 CFR Part 60, Appendix A, Method 18 as amended through October 17, 2000 (65 FR 61744). Samples must also be analyzed by American Standard of Testing Materials Standard D1946-77 to determine other potential constituents (e.g., hydrogen, nitrogen, methane, and carbon dioxide, and VOCs other than HRVOCs) sufficient to determine the molecular weight and net heating value of the gas combusted in the flare to within 5.0%. Net heating value of the gas combusted in the flare must be calculated according to the equation given in 40 CFR §60.18(f)(3). During periods of monitor downtime, these samples must be used to demonstrate that continuous compliance with the requirements of §115.722(a) - (d) of this title is met;

(5) for each one-hour block period, calculate the average net heating value of the gas combusted in the flare according to the equation given in 40 CFR §60.18(f)(3). Pilot gas must not be included in the determination of the net heating value;

(6) for each one-hour block period, calculate the average actual exit velocity of the flare based on continuous flow rate, temperature, and pressure monitor data, according to 40 CFR §60.18(f)(4); and

(7) calculate the HRVOC hourly average mass emission rates from the flare using the data gathered according to paragraphs (1) - (6) of this subsection, assuming a 99% destruction efficiency for ethylene and propylene and a 98% destruction efficiency for all other HRVOCs when the flare meets the heating value and exit velocity requirements of 40 CFR §60.18. During each one-hour block period when the flare is not in compliance with the net heating value or exit velocity requirements of 40 CFR §60.18, a destruction efficiency of 93% shall be assumed to calculate HRVOC mass emission rates.

(e) Flares used solely for abatement of emissions from marine loading operations or transport vessel loading and unloading operations are not required to comply with the monitoring requirements of subsection (d) of this section, provided the following specific requirements are satisfied.

(1) To demonstrate compliance with the minimum net heating value requirements of §115.722(d) of this title, a calorimeter must be calibrated, installed, operated, and maintained, in accordance with manufacturer recommendations, to continuously measure and record the net heating value of the gas sent to the flare, in British thermal units/standard cubic foot of the gas.

(2) The flare's actual exit velocity for each loading activity must be calculated on a one-hour block average basis, based on the maximum loading rate and the supplemental fuel rate corrected to standard temperature and pressure and the unobstructed (free) cross-sectional area of the flare tip, according to 40 CFR §60.18(f)(4) to demonstrate compliance with the exit velocity requirements of §115.722(d) of this title.

(3) The HRVOC hourly average mass emission rates from the flare must be calculated to demonstrate compliance with the site-wide cap in §115.722 of this title, using total HRVOC sent to the flare calculated based on loading emission calculations, and the speciated composition of the material being sent to the flare, assuming a 99% destruction efficiency for ethylene and propylene and a 98% destruction efficiency for all other HRVOCs when the flare meets the net heating value and exit velocity requirements of 40 CFR §60.18. During each one-hour block period when the flare does not meet the net heating value or exit velocity requirements of 40 CFR §60.18, a destruction efficiency of 93% must be assumed to calculate HRVOC mass emission rates.

(4) For flares that receive greater than 95% of an individual HRVOC at all times, the owner or operator may use process knowledge to determine net heating value for demonstrating compliance with §115.722(d) of this title.

(f) Flares used solely for abatement of emissions from scheduled or unscheduled maintenance, startup, or shutdown activities must comply with the continuous monitoring requirements in subsection (d) of this section, or satisfy all of the following requirements.

(1) A single flare must not be operated in HRVOC service for more than 720 hours at a site in any 12 consecutive months.

(2) The total number of hours for which a site may send HRVOCs temporarily to multiple flares as described in this subsection must not exceed 1,440 hours in 12 consecutive months.

(3) To demonstrate compliance with the minimum net heating value requirements of §115.722(d) of this title, a calorimeter must be calibrated, installed, operated, and maintained, in accordance with manufacturer recommendations, to continuously measure and record the net heating value of the gas sent to the flare, in British thermal units per standard cubic foot of the gas.

(4) The flow rate of the gas routed to the flare, in standard cubic feet per minute must be determined by either:

(A) complying with the monitoring requirements of subsection (d)(1) of this section; or

(B) using process knowledge and engineering calculations.

(5) The flare's actual exit velocity for each activity must be calculated on a one-hour block average basis, corrected to standard temperature and pressure and the unobstructed (free) cross-sectional area of the flare tip, according to 40 CFR §60.18(f)(4). The HRVOC hourly average mass emission rates from the flare must be calculated to demonstrate compliance with §115.722(a) - (c) of this title, using total HRVOC sent to the flare calculated based on process knowledge or actual measurement, assuming a 99% destruction efficiency for ethylene and propylene and a 98% destruction efficiency for all other HRVOCs when the flare meets the net heating value and exit velocity requirements of 40 CFR §60.18. During each one-hour block period when the flare does not meet the net heating value or exit velocity requirements of 40 CFR §60.18, a destruction efficiency of 93% must be assumed to calculate HRVOC mass emission rates.

(6) For flares that at all times receive greater than 95% of an individual HRVOC, the owner or operator may use process knowledge to determine net heating value for demonstrating compliance with §115.722(d) of this title.

(g) For an emergency flare, as defined in §115.10 of this title, subject to the requirements of this division, the owner or operator shall:

(1) comply with the continuous monitoring requirements in subsection (d) of this section; or

(2) use process knowledge and engineering calculations to determine compliance with the requirements of §115.722(a) - (d) of this title during an upset event. If this option is selected the owner or operator shall comply with the following:

(A) for emergency flares equipped with a physical seal (e.g., a water seal) that prevents emissions from being sent to the flare except during an upset event, the owner or operator shall install, calibrate, operate, and maintain, according to manufacturer's specifications, a continuous monitoring system that:

(i) monitors the status of the physical seal to ensure that emissions are not directed to the flare except during an upset event;

(ii) automatically records the time and duration of each event when emissions are sent to the flare; and

(iii) verifies that the physical seal has been restored after each event;

(B) for emergency flares not equipped with a physical seal that prevents emissions from being sent to the flare except during an upset event, the owner or operator shall:

(i) install, calibrate, operate, and maintain, according to manufacturers' specifications, a flow monitoring or indicating system to determine and record the time and duration of each event when emissions are sent to the flare; and

(ii) determine through process knowledge, engineering calculations, or actual testing, the baseline flow rate from any purge/sweep gas and the minimum flow rate indicative of an upset event;

(C) the owner or operator shall develop, implement, and follow a written monitoring plan to satisfy the requirements of subparagraph (A) or (B) of this paragraph. The monitoring plan must include:

(i) specifications for all monitors used to satisfy the requirements of subparagraph (A) or (B) of this paragraph;

(ii) the engineering calculations, process information, and actual testing used to determine volumetric flow rate, flare tip exit velocity, net heating value, and HRVOC emissions for compliance with §115.722(a) - (d) of this title; and

(iii) at a minimum, quarterly inspections of the continuous monitoring system to ensure proper operation;

(D) upon written request by the executive director, the monitoring plans required in accordance with subparagraph (C) of this paragraph shall be submitted within 30 days for review. The executive director may require additional or alternative monitoring requirements; and

(E) the flare's actual exit velocity for each activity must be calculated on a one-hour block average basis, corrected to standard temperature and pressure and the unobstructed (free) cross-sectional area of the flare tip, according to 40 CFR §60.18(f)(4). The HRVOC hourly average mass emission rates from the flare must be calculated, using total HRVOC sent to the flare calculated based on process knowledge or actual measurement, assuming a 99% destruction efficiency for ethylene and propylene and a 98% destruction efficiency for all other HRVOCs when the flare meets the net heating value and exit velocity requirements of 40 CFR §60.18. During each one-hour block period when the flare does not meet the net heating value or exit velocity requirements of 40 CFR §60.18, a destruction efficiency of 93% must be assumed to calculate HRVOC mass emission rates.

(h) Flares other than emergency flares that temporarily receive HRVOC emissions during any operation that is not a scheduled or unscheduled maintenance, startup, or shutdown activity as defined in §101.1 of this title must satisfy the following requirements.

(1) The flare must not be operated in HRVOC service for more than 336 hours at the plant site in any 12 consecutive months.

(2) The total number of hours for which a site may send HRVOCs temporarily to multiple flares as described in this subsection must not exceed 672 hours in 12 consecutive months.

(3) In lieu of the flow monitoring requirements of subsection (d)(1) of this section, the owner or operator may use one of the following to demonstrate compliance with §115.722(a) - (d) of this title:

(A) process knowledge;

(B) actual measurement; or

(C) for flares that temporarily receive HRVOC emissions from flare systems that are monitored in accordance with subsection (d) of this section, the flow monitoring data from the monitored flare system may be used as data substitution. Maximum one-hour average flow rate, excluding data from startups, shutdowns, maintenance, or emissions events, from the previous 30 operational days must be used to determine compliance with §115.722(a) - (d) of this title.

(4) In lieu of implementing the continuous monitoring requirements specified in subsection (d)(2) of this section, the owner or operator may use one of the following to demonstrate compliance with §115.722(a) - (d) of this title:

(A) for all flares in temporary HRVOC service, daily sampling in accordance with subsection (d)(4) of this section to determine net heating value and HRVOC concentrations; or

(B) for flares that temporarily receive HRVOC emissions for less than 72 consecutive hours from flare systems that are monitored in accordance with subsection (d) of this section, the monitoring data from the monitored flare system may be used as data substitution to satisfy compliance with §115.722(a) - (d) of this title. Maximum one-hour average total HRVOC concentrations and minimum one-hour average net heating value, excluding data from scheduled startups, shutdowns, maintenance, or emissions events, from the previous 30 operational days shall be used to determine compliance with §115.722(a) - (d) of this title.

(5) If an emissions event as defined in §101.1 of this title occurs while HRVOC emissions are being routed to a flare temporarily under this subsection, the owner or operator shall demonstrate compliance with the requirements of §115.722(a) - (d) of this title using process knowledge and engineering calculations in accordance with subsection (g)(2)(E) of this section.

(i) For flares specifically designed to receive and control liquid or dual phase streams containing HRVOCs, process knowledge and engineering calculations must be used to determine compliance with the requirements of §115.722(a) - (d) of this title in accordance with subsection (g)(2)(E) of this section.

(j) Flares that are used to control vent gases from metal alkyl production processes must comply with the continuous monitoring requirements in subsection (d) of this section, or satisfy the following requirements.

(1) The flow rate of the gas routed to the flare, in standard cubic feet per minute, must be determined by complying with the monitoring requirements of subsection (d)(1) of this section, for

demonstrating compliance with the site cap and exit velocity requirements in §115.722(a) - (d) of this title, in accordance with subsection (g)(2)(E) of this section. The owner or operator may submit a request to the executive director for alternative operational parameter monitoring in lieu of the flow monitoring specified in this paragraph for situations in which direct flow monitoring is not possible.

(2) Process knowledge and engineering calculations may be used to determine net heating value and HRVOC concentrations for demonstrating compliance with §115.722(a) - (d) of this title in accordance with subsection (g)(2)(E) of this section.

(k) For flares that are in multi-purpose service (e.g., an emergency flare that is also used to control emissions from emissions events and scheduled startup, shutdown, and maintenance activities), the owner or operator shall:

(1) comply with all continuous monitoring requirements in subsection (d) of this section; or

(2) comply with the most stringent requirements of each applicable subsection of this section. For the purposes of this paragraph:

(A) only flares subject to the monitoring requirements of subsections (e), (f), or (g) of this section can be considered as multi-purpose flares;

(B) the requirements of the applicable subsections that shall apply are as follows:

(i) for determining minimum net heating value for demonstrating compliance with §115.722(d) of this title, the requirements in subsections (e)(1) or (f)(3) of this section apply;

(ii) to determine volumetric flow rate and HRVOC emissions for demonstrating compliance with the exit velocity requirements and the site-wide cap requirements in §115.722(a) - (d) of this title, the following requirements shall apply:

(I) the requirements in subsection (e)(2) and (3) of this section during any loading operation, as specified in subsection (e) of this section; and

(II) the requirements in subsection (f)(4) and (5) of this section during any emissions event or scheduled startup, shutdown, or maintenance activity;

(iii) for flares used for scheduled or unscheduled startup, shutdown, or maintenance activities, as specified in subsection (f) of this section, the operational time limits in subsection (f)(1) and (2) of this section apply for time periods involving those specified activities; and

(iv) for flares used as emergency flares, as specified in §115.725(g), the requirements in subsection (g)(2)(A) - (D) of this section apply; and

(C) multiple clauses under subparagraph (B) of this paragraph apply. For example, a flare used for emergencies and startup, shutdown, and maintenance activities is subject to subparagraph (B)(i), (ii)(II), (iii), and (iv) of this paragraph.

(l) The owner or operator shall continuously operate each monitoring system as required by this section at least 95% of the operational time of the applicable flare, vent gas stream, or pressure relief valve, averaged over a calendar year. The percent measurement data availability must be calculated as the total operating hours for which valid quality-assured data was recorded divided by the total operating hours. Time required for normal calibration checks required by the provisions of this section is not considered downtime for purposes of this calculation. For the purposes of this calculation, the following apply:

(1) the operational time of an affected flare is any time the flare has the potential to receive HRVOCs;

(2) the operational time of an affected vent gas stream is any time the vent gas stream has the potential to emit HRVOCs; and

(3) the operational time of an affected pressure relief valve is any time HRVOCs are present upstream of the pressure relief valve.

(m) Minor modifications to either test methods or monitoring methods may be approved by the executive director. Test methods or monitoring methods other than those specified in this section may be used if approved by the executive director and validated by 40 CFR Part 63, Appendix A, Test Method 301 (December 29, 1992). For the purposes of this subsection, substitute "executive director" in each place that Test Method 301 references "administrator." The owner or operator does not require prior approval from the executive director for the following alternative monitoring approaches.

(1) In lieu of monitoring constituents for net heating value in accordance with subsection (d)(2) of this section, the owner or operator may install an online calorimeter to determine the net heating value. The calorimeter must be calibrated, installed, operated, and maintained, in accordance with manufacturer recommendations, to continuously measure and record the net heating value of the gas sent to the flare, in British thermal units/standard cubic foot of the gas; and

(2) The owner or operator may elect to demonstrate compliance with the minimum net heating value requirements of §115.722(d) of this title using the following procedure:

(A) install, calibrate, operate, and maintain a continuous flow monitor to monitor the supplementary fuel used to increase the net heating value of the gas stream sent to the flare; and

(B) continuously maintain sufficient supplementary fuel flow to meet the minimum net heating value requirements specified in §115.722(d) of this title while assuming zero net heating value contribution from all vent gas streams routed to the flare.

(3) The owner or operator of a flare in dedicated service for storage tanks with 95% or greater of an individual HRVOC may elect to determine net heating value and HRVOC concentrations using process knowledge and engineering calculations in lieu of the on-line analyzer required in subsection (d)(2) of this section.

(n) Upon written request by the executive director, the owner or operator shall submit the engineering calculations and process information used to determine volumetric flow rate, flare tip exit velocity, net heating value, and HRVOC emissions for compliance with the requirements of §115.722(a) - (d) of this title where applicable under the requirements of this section. The information must be submitted within 30 days for review.

Adopted December 1, 2004

Effective December 23, 2004

§115.726. Recordkeeping and Reporting Requirements.

(a) To satisfy the requirements of §115.725 of this title (relating to Monitoring and Testing Requirements), the owner or operator of each affected flare or vent gas stream shall, as applicable:

(1) develop, implement, and follow a written quality assurance plan (QAP) for the monitoring requirements (including installation, calibration, operation, and maintenance of continuous emissions monitoring systems) of this division (relating to Vent Gas Control) for each flare monitored in accordance with §115.725(d) of this title.

(A) The owner or operator shall maintain records on-site of the QAP and any revisions to the QAP.

(B) Upon written request by the executive director, the QAP required in this paragraph shall be submitted within 30 days for review. The executive director may specify revisions to the QAP;

(2) develop, implement, and follow a written test plan for flares and vent gas streams required to be tested in accordance with §115.725(a) of this title. The owner or operator must submit written notification to the Houston regional office at least 45 days prior to conducting any flare and vent gas stream testing required by §115.725(a) of this title to provide the commission opportunity to request a pretest meeting and observe the testing. The written notification must include, at a minimum, the following:

(A) the proposed test date; and

(B) the written test plan required by this paragraph.

(b) The owner or operator of a vent gas stream subject to the requirements of §115.725(a) of this title shall comply with the following recordkeeping requirements as applicable:

(1) maintain records of all testing conducted in accordance with §115.725(a) of this title to determine highly-reactive volatile organic compound (HRVOC) emission rates on a pounds-per-hour basis for each affected vent gas stream;

(2) maintain hourly records of the parameter monitoring in accordance with §115.725(a)(1) or (2) of this title;

(3) maintain records of the monitoring plans required under §115.725(a)(4) of this title;

(4) maintain hourly records of HRVOC emission rates on a pound-per-hour basis for each affected vent gas stream monitored in accordance with §115.725(b)(1) of this title;

(5) maintain records of all continuous emissions monitoring system calibrations and cylinder gas audits performed in accordance with §115.725(b)(1)(A) and (B) of this title;

(6) maintain records of all process information and calculations used to determine vent gas flow rate as specified in §115.725(b)(1)(C) of this title; and

(7) maintain records of all process information, actual testing, process monitoring data, and calculations used to comply with §115.725(a) of this title under the alternatives to the testing requirements in §115.725(b)(2) of this title;

(c) The owner or operator of a pressure relief valve subject to the requirements of §115.725(c) of this title shall comply with the following recordkeeping requirements:

(1) maintain records of the date, time, duration, volumetric flow rate, and speciated and total HRVOC emission rates on a pounds-per-hour basis for each pressure relief event;

(2) maintain hourly records of the parameter monitoring in accordance with §115.725(c)(1) of this title;

(3) maintain records of all process information, monitored data, and calculations used to determine volumetric flow rate and HRVOC hourly emission data as specified in §115.725(c)(2) of this title; and

(4) maintain records of the monitoring plans required under §115.725(c)(3) of this title.

(d) The owner or operator of a flare at a site that is subject to §115.722 of this title (relating to Site-wide Cap and Control Requirements) or the continuous monitoring requirements of §115.725 of this title shall comply with the following recordkeeping requirements:

(1) maintain hourly records of the speciated and total HRVOC emission rates on a pounds-per-hour basis for each affected flare in order to demonstrate compliance with §115.722 of this title;

(2) maintain records of all monitoring, testing, and calibrations performed in accordance with the provisions of §115.725 of this title;

(3) maintain records on a weekly basis that detail all corrective actions made to the continuous monitoring systems during monitor downtimes, and any delay in corrective action taken by documenting the dates, reasons, and durations of such occurrences;

(4) maintain records of each one-hour block average calculated net heating value of the gas stream routed to the flare and each one-hour block average calculated exit velocity at the flare tip, determined in accordance with the provisions of §115.725 of this title; and

(5) for flares subject to the monitoring requirements of §115.725(e) of this title, maintain records of each loading activity including, but not limited to:

(A) the nominal size of vessel being loaded;

(B) the start time and the end time for each vessel loaded;

(C) any compounds loaded at a concentration greater than 1% by weight, in addition to the compounds at a concentration greater than 1% by weight loaded into the vessel immediately previous to the current loading operation, if the vessel being loaded is not clean;

(D) the quantity of material loaded;

(E) the loading rate in gallons per minute;

(F) the method of loading, such as submerged fill, bottom fill, or splash loading; and

(G) all process information, monitored data, and calculations used to determine volumetric flow rate and HRVOC hourly emission data;

(6) for flares used solely for the abatement of emissions from scheduled or unscheduled maintenance, startup, or shutdown activities in §115.725(f) of this title, the owner or operator shall maintain records, including, but not limited to:

(A) the date, time, and duration for each flaring event;

(B) the volumetric flow rate, in standard cubic feet per minute, of the gas routed to the flare recorded in 15-minute block average periods, or portion thereof, for each flaring event; and

(C) all process information, monitored data, and calculations used to determine volumetric flow rate and HRVOC hourly emission data;

(7) for emergency flares subject to the requirements of §115.725(g) of this title, maintain records including, but not limited to:

(A) the date, time, and duration for each flaring event;

(B) the volumetric flow rate, in standard cubic feet per minute, of the gas routed to the flare recorded in 15-minute block average periods, or portion thereof, for each flaring event;

(C) all process information, monitored data, and calculations used to determine net heating value, volumetric flow rate, and HRVOC hourly emission data;

(D) hourly records of the parameter monitoring in accordance with §115.725(g)(2)(A) or (B) of this title; and

(E) records of the monitoring plans required under §115.725(g)(2)(C) of this title;

(8) for flares subject to the requirements of §115.725(h) or (i) of this title, maintain records including, but not limited to:

(A) the date, time, and duration for each flaring event;

(B) the volumetric flow rate, in standard cubic feet per minute, of the gas routed to the flare recorded in 15-minute block average periods, or portion thereof, for each flaring event; and

(C) all process information, monitored data, and calculations used to determine net heating value, volumetric flow rate, and HRVOC hourly emission data;

(9) for flares subject to the requirements of §115.725(j) of this title, the owner or operator shall maintain records including, but not limited to:

(A) the volumetric flow rate, in standard cubic feet per minute, of the gas routed to the flare recorded in 15-minute block average periods, or portion thereof, for each flaring event;

(B) all process information, monitored data, and calculations used to determine net heating value and HRVOC hourly emission data; and

(C) hourly records of parameter monitoring, if alternative parameter monitoring is approved by the executive director as specified in §115.725(j)(1)(A) of this title; and

(10) for flares considered to be multi-purpose flares, as specified in §115.725(k) of this title, the owner or operator shall maintain all applicable records as required in paragraphs (5) - (7) of this subsection.

(e) Records for exemptions in §115.727(a) - (e) of this title (relating to Exemptions) shall include the following.

(1) The owner or operator of any site claiming exemption under §115.727(a) of this title shall maintain records to document that each vent gas stream that is routed to a flare contains less than 5.0% by weight HRVOC at all times and each vent gas stream not routed to a flare does not exceed 100 parts per million by volume HRVOC at any time.

(2) The owner or operator of any flare claiming exemption under §115.727(b) of this title shall maintain records that document that the HRVOC content of the gas stream that is routed to the flare does not exceed 5.0% by weight at any time.

(3) The owner or operator of any vent gas stream or flare claiming exemption under §115.727 of this title shall comply with the following recordkeeping requirements:

(A) for vent gas streams, maintain records that demonstrate continuous compliance with the exemption criteria of §115.727(c) of this title; or

(B) for flares, maintain records that demonstrate continuous compliance with the exemption criteria of §115.727(d) of this title.

(f) The owner or operator claiming an exemption under §115.727(e) of this title shall submit written notification to the executive director no later than December 31, 2005.

(g) The owner or operator of each site subject to §115.722 of this title shall maintain daily records to demonstrate compliance with the tons per calendar year emissions limits specified in §115.722(a) and (b) of this title, including:

(1) cooling tower emissions from cooling towers that are subject to Division 2 of this subchapter (relating to Cooling Tower Heat Exchange Systems); and

(2) all emissions from flares, vents, and pressure relief valves subject to the requirements of §115.725 of this title.

(h) The owner or operator of each site subject to §115.722 of this title shall maintain hourly records to demonstrate compliance with the one-hour block emissions limits specified in §115.722(c) of this title, including:

(1) cooling tower emissions from cooling towers that are subject to Division 2 of this subchapter; and

(2) all emissions from flares, vents, and pressure relief valves subject to the requirements of §115.725 of this title.

(i) The owner or operator shall maintain on-site, all records required in this division and other records as necessary to demonstrate continuous compliance and records of periodic measurements for at least five years and make them available for review upon request by authorized representatives of the executive director, United States Environmental Protection Agency, or any local air pollution control agency with jurisdiction.

(j) The owner or operator of an affected flare, vent gas stream, or pressure relief valve subject to the requirements of this division that is reclassified as to the applicable requirements of the division or the exemption status, shall comply with the following:

(1) for affected flares, vent gas streams, or pressure relief valves that become exempt from the requirements of this division, maintain records of the date that the exemption became applicable as well as the recordkeeping requirements of subsection (e) of this section; and

(2) for affected flares, vent gas streams, or pressure relief valves that are reclassified as to operational status and the applicable requirements of the division (i.e., a continuous operation flare monitored in accordance with §115.725(d) of this title reclassified as an emergency flare and monitored according to §115.725(g) of this title), maintain records of the date of change in operational status and reclassification.

Adopted December 1, 2004

Effective December 23, 2004

§115.727. Exemptions.

(a) Any site for which all individual gas streams routed to a flare contain less than 5.0% by weight of highly-reactive volatile organic compounds (HRVOC) at all times, and all individual vent gas streams not routed to a flare contain less than 100 parts per million by volume (ppmv) HRVOC at all times, is exempt from the requirements of §115.722(a) - (c) of this title (relating to Site-wide Cap and Control Requirements).

(b) For a flare that at no time receives a gas stream containing 5.0% or greater HRVOC by weight:

(1) the gas stream directed to the flare shall be treated as a vent gas stream for purposes of determining compliance with §115.722(a) - (c) of this title; and

(2) the flare is exempt from the continuous monitoring requirements of §115.725(d) - (k) of this title (relating to Monitoring and Testing Requirements) and §115.726(d) of this title (relating to Recordkeeping and Recording Requirements) and is therefore not required to submit a quality assurance plan under §115.726(a) of this title.

(c) For vent gas streams that are not routed to a flare, the following exemptions may apply.

(1) A vent gas stream that has no potential to emit HRVOCs is exempt from the requirements of this division, with the exception of the recordkeeping requirements of §115.726(e)(3)(A) of this title.

(2) A vent gas stream that has the potential to emit HRVOCs, but that has an HRVOC concentration less than 100 ppmv at all times or has a maximum potential flow rate equal to or less than 100 dry standard cubic feet per hour is exempt from this division with the exception of the recordkeeping requirements of §115.726(e)(3)(A) of this title. The maximum potential HRVOC emissions for the sum of all vent gas streams claimed under this exemption, must be less for the account specified in §115.722(a) or (b) of this title than 0.5 tons per year.

(3) Vent gas streams from the following sources are exempt from the requirements of this division with the exception of the recordkeeping requirements of §115.726(e)(3)(A) of this title:

(A) vent gas streams resulting from the combustion of less than 5.0% by weight HRVOC in boilers, furnaces, engines, turbines, incinerators, and heaters;

(B) pressure tanks that maintain working pressure sufficient at all times to prevent any vapor or gas loss to the atmosphere;

(C) laboratory vent hoods;

(D) instrumentation air systems;

(E) atmospheric storage tanks;

(F) wastewater system vents;

(G) cooling towers; and

(H) equipment leak fugitive components, except for vents from pressure relief valves occurring when the process pressure is sufficient to overcome the preset pressure relief point of the pressure relief valve and emissions are either released directly to the atmosphere or routed to a control device.

(d) Any flare that at no time receives a total gas stream with greater than 100 ppmv HRVOC is exempt from the requirements of this division, with the exception of the recordkeeping requirements of §115.726(e)(3)(B) of this title.

(e) Any flare that will be permanently out of service by April 1, 2006, is exempt from the requirements of this division, with the exception of the notification and recordkeeping requirements in §115.726(f) of this title.

(f) All sites that are subject to this division and that are located in the Houston/Galveston/Brazoria area as defined in §115.10 of this title (relating to Definitions), excluding Harris County, are

exempt from §115.722(b) and (c)(2) of this title, except as provided in §115.729(a)(3) of this title (relating to Counties and Compliance Schedules).

Adopted December 1, 2004

Effective December 23, 2004

§115.729. Counties and Compliance Schedules.

(a) The owner or operator of each vent gas stream, pressure relief valve, and flare in Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties shall demonstrate compliance with the requirements of this division (relating to Vent Gas Control) as soon as practicable, but no later than December 31, 2005, with the exception of the following:

(1) §115.722(a) and (c)(2) of this title (relating to Site-wide Cap and Control Requirements) for which the owner or operator shall demonstrate compliance as soon as practicable, but not later than January 1, 2007;

(2) §115.722(b) and (c)(1) of this title for which the owner or operator shall demonstrate compliance as soon as practicable, but no later than April 1, 2006; and

(3) the exemption in §115.727(f) of this title (relating to Exemptions) will no longer apply upon public notice of revocation by the commission. Upon revocation of §115.727(f) of this title, sites subject to this division located in the Houston/Galveston/Brazoria area, as defined in §115.10 of this title (relating to Definitions), excluding Harris County, shall comply with paragraphs (1) and (2) of this subsection by the dates specified in those paragraphs, or within 180 days of public notice, whichever is later.

(b) For vent gas streams, flares, and pressure relief valves that become subject to the requirements of this subdivision after December 31, 2005, testing and monitoring must be conducted as soon as practicable, but no later than 60 days after being brought into highly-reactive volatile organic compound service.

Adopted December 1, 2004

Effective December 23, 2004