

REGULATION 6.49 Standards of Performance for Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry

**Air Pollution Control District of Jefferson County
Jefferson County, Kentucky**

Relates To: K.RS Chapter 77 Air Pollution Control

Pursuant To: KRS Chapter 77 Air Pollution Control

Necessity and Function: K.RS 77. 180 authorizes the Air Pollution Control Board to adopt and enforce all orders, rules, and regulations necessary or proper to accomplish the purposes of KRS Chapter 77. This regulation provides for the control of emissions from reactor processes and distillation operations processes in the synthetic organic chemical manufacturing industry (SOCMI).

SECTION 1 Definitions

Terms used in this regulation that are not defined in this regulation shall have the meaning given them in Regulation 1.02 *Definitions*.

- 1.1 "Batch mode" means a noncontinuous operation or process in which a discrete quantity or batch of feed is charged into a process unit and distilled or reacted at one time.
- 1.2 "Boiler" means any enclosed combustion device that extracts useful energy in the form of steam.
- 1.3 "By compound" means by individual stream components, not carbon equivalents.
- 1.4 "Continuous recorder" means a data recording device capable of recording an instantaneous data value at least once every 15 minutes.
- 1.5 "Distillation operation" means an operation separating, by heating or pressure change, 1 or more feed streams into 2 or more exit streams, each exit stream having component concentrations different from those in the feed stream. The separation is achieved by the redistribution of the components between the liquid and vapor phase as they approach equilibrium within the distillation unit.
- 1.6 "Distillation unit" means a device or vessel in which distillation operations occur, including all associated internals (such as trays or packing) and accessories (such as reboiler, condenser, vacuum pump, steam jet, etc.) plus any associated recovery system.
- 1.7 "Flame zone" means the portion of the combustion chamber in a boiler occupied by the flame envelope.
- 1.8 "Flow indicator" means a device that indicates whether gas flow is present in a vent stream.
- 1.9 "Halogenated vent stream" means any vent stream determined to have a total concentration of halogen atoms by volume contained in organic compounds of 200 parts per million by volume (ppmv) or greater as determined by Method 18 of 40 CFR 60 Appendix A, other test or data validated by Method 301 of 40 CFR 63 Appendix A, or by engineering assessment or process knowledge.
- 1.10 "Incinerator" means any enclosed combustion device that is used for oxidizing organic compounds. Auxiliary fuel may be used to heat waste gas to combustion temperatures. Any energy recovery section present is not physically formed into 1 section; rather, the energy recovery system is a separate section following the combustion section and the 2 sections are joined by ducting or connections that carry fuel gas.
- 1.11 "Primary fuel" means the fuel that provides the principal heat input to the device. To be

considered primary, the fuel must be able to sustain operation without the addition of other fuels.

- 1.12 "Process heater" means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that is heated to produce steam.
- 1.13 "Process unit" means equipment assembled and connected by pipes or ducts to produce, as intermediates or final products, 1 or more SOCFI chemicals. A process *unit* can operate independently if supplied with sufficient feed or raw materials and sufficient product storage facilities.
- 1.14 "Product" means any compound or SOCFI chemical that is produced as that chemical for sale as a product, by-product, co-product, or intermediate or for use in the production of other chemicals or compounds.
- 1.15 "Reactor processes" mean *unit* operations in which 1 or more chemicals, or reactants other than air, are combined or decomposed in such a way that their molecular structures are altered and 1 or more new organic compounds are formed.
- 1.16 "Recovery device" means an individual unit of equipment, such as an adsorber, carbon adsorber, or condenser, capable of, and used for the purpose of, recovering chemicals for use, reuse, or sale.
- 1.17 "Recovery system" means an individual recovery device or series of such devices applied to the same vent stream.
- 1.18 "SOCFI chemical" means a chemical listed in *Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry*, EPA-450/4-91-031, August 1993, Appendix A *List of Synthetic Organic Chemical Manufacturing Industry Chemicals*, Table A-1 *List of Synthetic Organic Chemical Manufacturing Industry Chemicals* in the column titled *Reactor and distillation CTG*.
- 1.19 "Total resource effectiveness index value" or "TRE index value" means a measure of the supplemental total resource requirement per unit reduction of VOCs associated with a process vent stream, based on vent stream flow rate, emission rate of VOCs, net heating value, and corrosion properties (whether or not the vent stream contains halogenated compounds) as determined using the equations in Section 4. The TRE index value is a decision tool used to determine if the annual cost of controlling a given vent gas stream is reasonable when considering the emissions reduction achieved.
- 1.20 "Vent stream" means any gas stream discharge directly from a distillation operation or reactor process to the atmosphere or indirectly to the atmosphere after diversion through other process equipment. The vent stream excludes relief valve discharges and equipment leaks including, but not limited to, pumps, compressors, and valves.

SECTION 2 Applicability

- 2.1 This regulation applies to any vent stream originating from a process unit in which a reactor process or distillation operation is located and 1 or more SOCFI chemicals are produced.
- 2.2 Exemptions from some or all of the provisions of this regulation are as follows:
 - 2.2.1 Any reactor process or distillation operation that is designed and operated in a batch mode is not subject to the provisions of this regulation.
 - 2.2.2 Any reactor process or distillation operation that is part of a polymer manufacturing operation is not subject to the provisions of this regulation.
 - 2.2.3 Any reactor process or distillation operation operating in a process unit with a total

design capacity of less than 1 gigagram per year for all chemicals produced within that unit is not subject to the provisions of this regulation except for the reporting and recordkeeping requirements listed in section 6.2.

- 2.2.4 Any vent stream for a reactor process or distillation operation with a flow rate less than 0.0085 standard cubic meter per minute or a total VOC concentration less than 500 ppmv is not subject to the provisions of this regulation except for the performance testing requirements listed in either section 4.3.2 or section 4.9, respectively, and the reporting and recordkeeping requirements listed in section 6.3.

SECTION 3 Control Requirements

- 3.1 For individual vent streams within a process unit with a TRE index value less than or equal to 1.0, the owner or operator shall comply with either of the following control requirements:
- 3.1.1 Reduce the VOC in the vent stream by either 98 % by weight or to 20 ppmv on a dry gas basis corrected to 3 % oxygen, whichever is less stringent. If a boiler or process heater is used to comply with this provision, then the vent stream shall be introduced into the flame zone of the boiler or process heater, or
- 3.1.2 Combust the VOC in the vent stream in a flare. Flares used to comply with this provision shall comply with the requirements of 40 CFR §60.18. These flare control requirements temporarily do not apply if a process not subject to the control requirement of this regulation vents an emergency relief discharge into a common flare header and causes the flare servicing the vent stream subject to this regulation to be out of compliance with 1 or more of the provisions of 40 CFR §60.18.
- 3.2 For individual vent streams within a process unit with a TRE index value greater than 1.0, the owner or operator shall maintain the vent stream parameters that result in a calculated TRE index value greater than 1.0 without the use of a VOC control device. The TRE index value shall be calculated at the outlet of the final recovery device.

SECTION 4 TRE Index Value Determination, Performance Testing, and Exemption Testing

- 4.1 Engineering Assessment
- 4.1.1 For the purpose of determining the TRE index value pursuant to section 3.2, an engineering assessment may be used to determine the process unit vent stream flow rate, net heating value, and VOC emission rate for the representative operating condition expected to yield the lowest TRE index value.
- 4.1.2 If the TRE index value calculated using an engineering assessment is greater than 4.0, then it is not required that the owner or operator perform the measures specified in section 4.5.
- 4.1.3 If the TRE index value calculated using an engineering assessment is less than or equal to 4.0, then the owner or operator shall perform the measurements specified in section 4.5 .
- 4.1.4 All data, assumptions, and procedures used in an engineering assessment shall be documented. Engineering assessment includes, but is not limited to, the following:
- 4.1.4.1 Previous test results, if the tests are representative of current operating practices at
- 4.1.4.2 the process unit,
- 4.1.4.3 Bench-scale or pilot-scale test data representative of the process unit under representative operating conditions,
- Maximum flow rate specified or implied within a permit limit applicable to the

- process vent, and
- 4.1.4.4 Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties. Examples for analytical methods include, but are not limited to, the following:
- 4.1.4.4.1 Use of material balances based on process stoichiometry to estimate maximum VOC concentrations,
- 4.1.4.4.2 Estimation of maximum flow rate based on physical equipment design such as pump or blower capacities,
- 4.1.4.4.3 Estimation of VOC concentrations based on saturation conditions,
- 4.1.4.4.4 Estimation of the maximum expected net heating value based on the stream concentration of each organic compound, or, alternatively, as if all VOC in the vent stream were the compound with the highest heating value.
- 4.2 For the purpose of demonstrating compliance with the control requirements of this regulation, the process unit shall be run at representative operating conditions and flow rates during any performance test.
- 4.3 The following methods in 40 CFR 60 Appendix A shall be used to demonstrate compliance with the emission limit or percent reduction efficiency requirement of section 3.1.1:
- 4.3.1 Method 1 or 1A, as appropriate, for selection of the sampling sites. The control device inlet sampling site for determination of vent stream molar composition or VOC reduction efficiency shall be located after the last recovery device but prior to the inlet of the control device, prior to any dilution of the process vent stream, and prior to release to the atmosphere,
- 4.3.2 Method 2, 2A, 2C, or 2D, as appropriate, for determination of gas stream volumetric flow rate,
- 4.3.3 The emission rate correction factor, integrated sampling, and analysis procedure of Method 3 to determine the oxygen concentration (% O₂) for the purpose of determining compliance with the 20 ppmv limit. The sampling site shall be the same as that of the VOC samples, and samples shall be taken during the same time that the VOC samples are taken. The VOC concentration, corrected to 3 % oxygen (C_c) shall be computed using the following equation:

$$C_c = C_{voc} \cdot \frac{17.9}{20.9 - \% O_{2d}}$$

where:

- C_c = Concentration of VOC (ppmv) corrected to 3 % O₂ on a dry gas basis,
- C_{voc} = Concentration of VOC (ppmv) on a dry gas basis, and
- % O_{2d} = Concentration of oxygen (% by volume) on a dry gas basis,

- 4.3.4 Method 18 to determine the concentration of VOC at the outlet of the control device when determining compliance with the 20 ppmv limit or at both the control device inlet and outlet when the reduction efficiency of the control device is to be determined.
- 4.3.4.1 The minimum sampling time for each run shall be 1 hour during which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used, then the samples shall be taken at 15-minute intervals.

4.3.4.2 The emission reduction "R" of VOC shall be determined using the following equation:

$$R = \frac{E_i - E_o}{E_i} \cdot 100$$

where:

- R = Emission reduction (% by weight),
- E_i = Mass rate of VOC (kilogram per hour) entering the control device, and
- E_o = Mass rate of VOC (kilogram per hour) discharged to the atmosphere.

4.3.4.3 The mass rates of VOC (E_i, E_o) shall be computed using the following equations:

$$E_i = K_2 \left[\sum_{j=1}^n C_{ij} M_j \right] Q_i$$

$$E_o = K_2 \left[\sum_{j=1}^n C_{oj} M_j \right] Q_o$$

where:

- C_{ij}, C_{oj} = Concentration of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, dry basis, ppmv,
- M_j, j = Molecular weight of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, grams per gram-mole,
- Q_i, Q_o = Flow rate of gas stream at the inlet and outlet of the control device, respectively, dry standard cubic meters per minute, and
- K₂ = 2.494 @ 10⁶ (liters per minute) (gram-mole per standard cubic meter) (kilogram per gram) (minute per hour), where standard temperature for (gram-mole per standard cubic meter) is 20°C.

4.3.4.4 The VOC concentration (C_{voc}) is the sum of the individual components and shall be

computed for each run using the following equation:

$$C_{\text{voc}} = \sum_{j=1}^n C_j$$

where:

- C_{voc} = Concentration of VOC, dry basis, ppmv,
- C_j = Concentration of sample component "j", dry basis, ppmv, and
- n = Number of components in the sample, and

- 4.3.5 When a boiler or process heater with a design heat input capacity of 44 megawatts or greater, or a boiler or process heater into which the process vent stream is introduced with the primary fuel, is used to comply with the control requirements, an initial performance test is not required.
- 4.4 When a flare is used to comply with the control requirements of this regulation, the flare shall comply with the requirements of 40 CFR §60.18.
- 4.5 The following test methods shall be used to determine compliance with the TRE index value:
- 4.5.1 Method 1 or 1A, as appropriate, for selection of the sampling site, with the following provisions:
- 4.5.1.1 The sampling site for the vent stream molar composition determination and flow rate prescribed in section 4.5.2 and section 4.5.3 shall be, except for the situations outlined in section 4.5.1.2, after the final recovery device, if a recovery system is present, prior to the inlet of any control device, and prior to any post-reactor or post-distillation unit introduction of halogenated compounds into the process vent stream. No traverse site selection method is needed for vents smaller than 10 centimeters in diameter, and
- 4.5.1.2 If any gas stream other than the reactor or distillation vent stream is normally conducted through the final recovery device, then the following apply:
- 4.5.1.2.1 The sampling site for vent stream flow rate and molar composition shall be prior to the final recovery device and prior to the point at which any nonreactor or nondistillation stream or stream from a nonaffected reactor or distillation unit is introduced. Method 18 shall be used to measure organic compound concentrations at this site,
- 4.5.1.2.2 The efficiency of the final recovery device is determined by measuring the organic compound concentrations using Method 18 at the inlet to the final recovery device after the introduction of all vent streams and at the outlet of the final recovery device, and
- 4.5.1.2.3 The efficiency of the final recovery device determined according to section 4.5.1.2.2 shall be applied to the organic compound concentrations measured according to section 4.5.1.2.1 to determine the concentrations of organic compounds from the final recovery device attributable to the reactor or distillation vent stream. The resulting organic compound concentrations are then used to perform the calculations outlined in section 4.5.4,
- 4.5.2 The molar composition of the vent stream shall be determined using the following procedures:
- 4.5.2.1 Method 18 to measure the concentration of organic compounds including those containing halogens,
- 4.5.2.2 ASTM D 1946-77 to measure the concentration of carbon monoxide and hydrogen, and
- 4.5.2.3 Method 4 to measure the content of water vapor,
- 4.5.3 The volumetric flow rate shall be determined using Method 2, 2A, 2C, or 2D, as appropriate,
- 4.5.4 The emission rate of VOC (Evoc) in the vent stream shall be calculated using the following equation:

$$E_{\text{voc}} = K_2 \left[\sum_{j=1}^n C_j M_j \right] Q_s$$

where:

E_{voc} = Emission rate of VOC in the sample (kilograms per hour),

K_2 = Constant, 2.494×10^{-6} (liters per parts per million) (gram-moles per standard cubic meter) (kilogram per gram) (minute per hour), where standard temperature for (gram-mole per standard cubic meter) (g-mole/scm) is 20°C,

C_j = Concentration of compound "j", on a dry basis, in parts per million as measured by Method 18, as indicated in section 4.3.3,

M_j = Molecular weight of sample "j", grams per gram-mole, and

Q_s = Vent stream flow rate, on a dry basis, in standard cubic meters per minute at a standard temperature of 20°C,

- 4.5.5 The total process vent stream concentration (by volume) of compounds containing halogens (ppmv, by compound) shall be summed from the individual concentrations of halogen atoms from compounds containing halogens that were measured by Method 18, and
- 4.5.6 The net heating value of the vent stream shall be calculated by using the equation:

where:

H_T = Net heating value of the sample (megajoule per standard cubic meter), T where the net enthalpy per mole of vent stream is based on combustion at 25EC and 760 millimeters of mercury, but the standard temperature for determining the volume corresponding to 1 mole is 20EC, as in the definition of Q (vent stream flow rate),

K_1 = Constant, 1.740×10^{-7} (parts per million) (gram-mole per standard cubic meter), (megajoule per kilocalorie), where standard temperature for (gram-mole per standard cubic meter) is 20°C,

B_{ws} = Water vapor content of the vent stream, proportion by volume; except that if the vent stream passes through a final stream jet and is not condensed, it shall be assumed that $B_{ws} = 0.023$ in order to correct to 2.3 % moisture,

C_j = Concentration on a dry gas basis of compound "j" in parts per million, as measured for all organic compounds by Method 18 and measured for hydrogen and carbon monoxide by the American Society for Testing and Materials D1946-77, and

H_j = Net heat of combustion of compound "j", kilocalorie per gram-mole, based on combustion at 25EC and 760 millimeters of mercury. The heats of combustion of vent stream components shall be determined using

American Society for Testing and Materials D2382-76 if published values are not available or cannot be calculated.

4.6 TRE Index Value Calculation

4.6.1 The TRE index value of the vent shall be calculated using the following equation:

$$TRE = \frac{1}{E_{voc}} [a \cdot b Q_s \cdot c H_T \cdot d E_{voc}]$$

where:

TRE = TRE index value,

E_{voc} = Hourly emission rate of VOC (kilograms per hour) as calculated in section 4.5.4,

Q_s = Vent stream flow rate on a dry basis, in standard cubic meters per minute at a standard temperature of 20 °C

H_r = Vent stream net heating value (megajoules per standard cubic meter) as calculated in section 4.5.6, and

a,b,c,d = Coefficients as listed in Table 1.

4.6.2 The owner or operator of a nonhalogenated vent stream shall use the applicable coefficients in Table 1 to calculate the TRE index value based on a flare, a thermal incinerator with 0 % heat recovery, and a thermal incinerator with 70 % heat recovery, and shall select the lowest TRE index value.

4.6.3 The owner or operator of a unit with a halogenated vent stream determined as any stream with a total concentration of halogen atoms contained in organic compounds of 200 ppmv or greater shall use the applicable coefficients in Table I to calculate the TRE index value based on a thermal incinerator and scrubber.

Table 1
Coefficients for TRE for Nonhalogenated and Halogenated Vent Streams

Type of Stream	Control Device Basis	Values of Coefficients			
		a	b	c	d
Nonhalogenated	Flare	2.129	0.183	-0.005	0.359
	Thermal incinerator with 0 % heat recovery	3.075	0.021	-0.037	0.018
	Thermal incinerator with 70 % heat recovery	3.803	0.032	-0.042	0.007
Halogenated	Thermal incinerator and scrubber	5.470	0.181	-0.040	0.004

4.7 The owner or operator of an individual vent stream within a process unit with a TRE index value greater than 1.0 subject to the control requirement provision of section 3.2 shall recalculate the flow rate and VOC concentration for that affected facility whenever process

changes are made. Examples of process changes include, but are not limited to, changes in production capacity, feedstock type, or catalyst type, or whenever there is replacement, removal, or addition of recovery equipment. The flow rate and VOC concentration shall be recalculated based on test data or on best engineering estimates of the effects of the change to the recovery system.

- 4.8 Where the recalculated values pursuant to section 4.7 yield a TRE index value s ; 1.0, the owner or operator shall notify the District within 1 week of the recalculation and shall conduct a performance test according to the methods and procedures required by Section 4 within 60 days of that notification.
- 4.9 For the purpose of demonstrating that a process vent stream has a VOC concentration below 500 parts per million by volume, the following procedures shall be followed:
 - 4.9.1 The sampling site shall be selected as specified in section 4.3.1,
 - 4.9.2 Method 18 or Method 25A of Part 60 Appendix A shall be used to measure concentration; alternatively, any other method or data that has been validated according to the protocol in Method 301 of Part 63 Appendix A may be used,
 - 4.9.3 Where Method 18 is used, the following procedures shall be used to calculate ppmv concentration:
 - 4.9.3.1 The minimum sampling time for each run shall be 1 hour in which either an integrated sample or four grab samples shall be taken. If grab sampling is used, then the samples shall be taken at approximately equal intervals in time, such as 15 minute intervals during the run, and
 - 4.9.3.2 The concentration of voc shall be calculated using Method 18 according to section 4.3.4,
 - 4.9.4 Where Method 25A is used, the following procedures shall be used to calculate the VOC concentration in ppmv:
 - 4.9.4.1 Method 25A shall be used only if a single VOC is greater than 50 % of total VOC, by volume, in the process vent stream,
 - 4.9.4.2 The process vent stream composition may be determined by either process knowledge, test data collected using an appropriate EPA Method, or a method of data collection validated according to the protocol in Method 301 of Part 63 Appendix A. Examples of information that could constitute process knowledge include calculations based on material balances, process stoichiometry, or previous test results provided the results are still relevant to the current process vent stream conditions,
 - 4.9.4.3 The VOC used as the calibration gas for Method 25A shall be the single VOC present at greater than 50 % of the total VOC by volume,
 - 4.9.4.4 The span value for Method 25A shall be 50 ppmv,
 - 4.9.4.5 Use of Method 25A is acceptable if the response from the high-level calibration gas is at least 20 times the standard deviation of the response from the zero calibration gas when the instrument is zeroed on the most sensitive scale, and
 - 4.9.4.6 The concentration of VOC shall be corrected to 3 % oxygen using the procedures and equation in section 4.3.3, and
 - 4.9.5 To qualify for the low concentration exemption pursuant to section 2.2.4, the owner or operator shall demonstrate 1 of the following:
 - 4.9.5.1 The concentration of VOC plus methane and ethane is below 250 ppmv, as measured by Method 25A, or

- 4.9.5.2 The concentration of VOC is below 500 parts ppmv, as measured by Method 18.

SECTION 5 Monitoring Requirements

- 5.1 The owner or operator of an affected facility that uses an incinerator to comply with the VOC emission limit specified in section 3.1 shall install, calibrate, maintain, and operate according to the manufacturer's specifications a temperature monitoring device equipped with a continuous recorder and having an accuracy of $\pm 1\%$ of the temperature being measured expressed in degrees Celsius or $\pm 0.5^\circ\text{C}$, whichever is greater.
- 5.1.1 Where an incinerator other than a catalytic incinerator is used, a temperature monitoring device shall be installed in the firebox.
- 5.1.2 Where a catalytic incinerator is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.
- 5.2 The owner or operator of an affected facility that uses a boiler or process heater with a design heat input capacity of less than 44 megawatts to comply with section 3.1.1 shall install, calibrate, maintain, and operate according to the manufacturer's specifications a temperature monitoring device in the firebox. The monitoring device shall be equipped with a continuous recorder and shall have an accuracy of $\pm 1\%$ of the temperature being measured expressed in degrees Celsius or $\pm 0.5^\circ\text{C}$, whichever is greater. Any boiler or process heater in which all vent streams are introduced with primary fuel is exempt from this requirement.
- 5.3 The owner or operator of an affected facility that uses a flare to comply with section 3.1.2 shall install, calibrate, maintain, and operate according to the manufacturer's specifications a heat-sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light to indicate continuous presence of a flame.
- 5.4 The owner or operator of an individual vent stream within a process unit with a TRE index value greater than 1.0 subject to the control requirement provision of section 3.2 shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment as applicable:
- 5.4.1 Where an absorber is the final recovery device in the recovery system, the following:
- 5.4.1.1 A scrubbing Liquid temperature monitor equipped with a continuous recorder and having an accuracy of $\pm 1\%$ of the temperature being monitored expressed in $^\circ\text{C}$ or $\pm 0.5^\circ\text{C}$, whichever is greater, and
- 5.4.1.2 Specific gravity monitor equipped with continuous recorders having an accuracy of ± 0.02 ,
- 5.4.2 Where a condenser is the final recovery device in the recovery system, a condenser exit (product side) temperature monitoring device equipped with a continuous recorder and having an accuracy of $\pm 1\%$ of the temperature being monitored expressed in $^\circ\text{C}$ or $\pm 0.5^\circ\text{C}$, whichever is greater,
- 5.4.3 Where a carbon adsorber is the final recovery device unit in the recovery system, the following:
- 5.4.3.1 An integrating regeneration stream flow monitoring device having an accuracy of $\pm 10\%$ of the total flow, capable of recording the total regeneration stream mass flow for each regeneration cycle, and
- 5.4.3.2 A carbon bed temperature monitoring device having an accuracy of $\pm 1\%$ of the temperature being monitored expressed in $^\circ\text{C}$ or $\pm 0.5^\circ\text{C}$, whichever is greater, capable of recording the carbon bed temperature after each regeneration and within 15 minutes of completing any cooling cycle,

- 5.4.4 Where an absorber scrubs halogenated streams after an incinerator, boiler, or process heater, the following:
 - 5.4.4.1 A pH monitoring device equipped with a continuous recorder, and
 - 5.4.4.2 Flow meters equipped with continuous recorders to be located at the scrubber influent for liquid flow and the scrubber inlet for gas stream flow, or
- 5.4.5 As an alternative to the monitoring equipment specified in section 5.4.1, 5.4.2, or 5.4.3, an organics monitoring device equipped with a continuous recorder.
- 5.5 The owner or operator of a process vent using a vent system that contains bypass lines that could divert a vent stream away from the combustion device used shall comply with 1 of the following:
 - 5.5.1 Install, calibrate, maintain, and operate a flow indicator that provides a record of vent stream flow at least once every 15 minutes. The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream away from the combustion device to the atmosphere, or
 - 5.5.2 Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line.

SECTION 6 Recordkeeping and Reporting Requirements

- 6.1 The owner or operator of each reactor process or distillation operation subject to this regulation shall keep records of the following parameters, as applicable, measured during a performance test or TRE index value determination required under Section 4 and required to be monitored under Section 5:
 - 6.1.1 For a thermal or catalytic incinerator used to comply with section 3.1.1, the following:
 - 6.1.1.1 average firebox temperature of the incinerator, or the average temperature upstream and downstream of the catalyst bed for a catalytic incinerator, measured at least every 15 minutes and averaged over the same time period of the performance testing, and
 - 6.1.1.2 The percent reduction of VOC determined as specified in section 4.3 achieved by the incinerator, or the concentration of VOC (ppmv, by compound) determined as specified in section 4.3 at the outlet of the control device on a dry basis corrected to 3 % oxygen,
 - For a boiler or process heater used to comply with section 3.1.1 in which all vent streams are not introduced with primary fuel, the following:
 - 6.1.2 A description of the location at which the vent stream is introduced into the boiler or process heater, and
 - 6.1.2.1 The average combustion temperature of the boiler or process heater with a design heat input capacity of less than 44 megawatt measured at least every 15 minutes and averaged over the same time period of the performance testing,
 - 6.1.2.2
 - For a boiler or process heater used to comply with section 3.1.1 in which all vent streams are introduced with primary fuel, no records are required,
 - 6.1.3 For a smokeless flare used to comply with section 3.1.2, the following:
 - 6.1.4 design (i.e., steam-assisted, air-assisted, or nonassisted),
 - 6.1.4.1 All visible emission readings, heat content determinations, flow rate measurements, and
 - 6.1.4.2 exit velocity determinations made during the performance test,

- 6.1.4.3 Continuous records of the flare pilot flame monitoring, and
- 6.1.4.4 Records of all periods of operations during which the pilot flame is absent,
- 6.1.5 For an adsorber as the final recovery device of a recovery system used to comply with section 3.2, the following as measured while the vent stream is normally routed and constituted:
 - 6.1.5.1 The exit specific gravity, or, if approved by the District, an alternative parameter that is a measure of the degree of absorbing liquid saturation, and
 - 6.1.5.2 Average exit temperature of the absorbing liquid measured at least every 15 minutes and averaged over the same time period of the performance testing,
- 6.1.6 For a condenser as the final recovery device of a recovery system used to comply with section 3.2, the average exit (product side) temperature measured at least every 15 minutes and averaged over the same time period of the performance testing, as measured while the vent stream is normally routed and constituted,
- 6.1.7 For a carbon adsorber as the final recovery device of a recovery system used to comply with section 3.2, the following as measured while the vent stream is normally routed and constituted:
 - 6.1.7.1 The total stream mass or volumetric flow measured at least every 15 minutes and averaged over the same time period of the performance test (full carbon bed cycle,
 - 6.1.7.2 Temperature of the carbon bed after regeneration and within 15 minutes of completion of any cooling cycle, and
 - 6.1.7.3 Duration of the carbon bed steaming cycle,
- 6.1.8 As an alternative to the records required by section 6.1.5, 6.1.6, or 6.1.7, the concentration level or reading indicated by the organics monitoring device at the outlet of the absorber, condenser, or carbon adsorber, measured at least every 15 minutes and averaged over the same time period as the performance testing while the vent stream is normally routed and constituted, and
- 6.1.9 For any recovery system used to comply with section 3.2, the following:
 - 6.1.9.1 All measurements and calculations performed to determine the flow rate and VOC concentration, heating value, and TRE index value of the vent stream,
 - 6.1.9.2 Any changes in production capacity, feedstock type, or catalyst type, or of any replacement, removal, and addition of recovery equipment or reactors and distillation units, and
 - 6.1.9.3 Any recalculation of the flow rate, VOC concentration, or TRE index value performed according to section 4.7.
- 6.2 The owner or operator of each reactor process or distillation operation that is exempt from some of the provisions of this regulation pursuant to the 1 gigagram design production capacity exemption of section 2.2.3 shall keep records of the design production capacity or any changes in equipment or process operation that may affect design production capacity of the affected process unit.
- 6.3 The owner or operator of each reactor process or distillation operation that is exempt from some of the provisions of this regulation pursuant to section 2.2.4 shall keep records to indicate that the stream flow rate is less than 0.0085 standard cubic meter per minute or the concentration is less than 500 ppmv, as applicable.
- 6.4 Each record required by section 6.1, 6.2, and 6.3 shall be maintained for a minimum of 5 years and made available to the District upon request.
- 6.5 Beginning July 1, 2001, the owner or operator of a reactor process or distillation operation

that is subject to any provision of *this* regulation shall keep a record identifying all deviations from the requirements of this regulation and shall submit to the District a written report of all deviations that occurred during the preceding semi-annual period. Semi-annual periods shall run from January 1 to June 30 and July 1 to December 31. If no deviation occurred during the semi-annual period, then the report shall contain a negative declaration. Each report shall be submitted within 60 days following the end of the semi-annual period. The report shall contain the following information:

- 6.5.1 An identification of the reactor process or distillation operation,
- 6.5.2 The beginning and ending date of the reporting period,
- 6.5.3 Identification of all periods during which a deviation occurred,
- 6.5.4 A description, including the magnitude, of the deviation,
- 6.5.5 If known, the cause of the deviation, and
- 6.5.6 A description of all corrective actions taken to abate the

deviation. Adopted vl/6-20-01; effective 6-20-01.

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