the Group 1 process vent provisions in paragraph (a) of this section and, if they apply, the halogenated Group 1 process vent provisions in paragraph (b) of this section upon initial startup after the change and thereafter unless the owner or operator demonstrates to the Administrator that achieving compliance will take longer than making the process change. If this demonstration is made to the Administrator's satisfaction, the owner or operator shall comply as expeditiously as practical, but in no event later than 3 years after the emission point becomes Group 1, and shall comply with the following procedures to establish a compliance date:

(i) The owner or operator shall submit to the Administrator for approval a compliance schedule, along with a justification for the schedule.

(ii) The compliance schedule shall be submitted with the operating permit application or amendment or by other appropriate means.

(iii) The Administrator shall approve the compliance schedule or request changes within 120 calendar days of receipt of the compliance schedule and justification.

(5) *Group status change to Group 2A.* Whenever a process change causes the process vent group status to change to Group 2A, the owner or operator shall comply with the provisions of paragraph (c) or (d) of this section upon completion of the group status determination of the process vent.

(6) *Group status change to Group 2B.* Whenever a process change causes the process vent group status to change to Group 2B, the owner or operator shall comply with the provisions of paragraph (e) of this section as soon as practical after the process change.

§ 65.64 Group determination procedures.

(a) *General.* The provisions of this section provide calculation and measurement methods for parameters that are used to determine group status.

(b)(1) *Sampling site.* For purposes of determining TOC or HAP concentration, process vent volumetric flow rate, heating value, or TRE index value as specified under paragraph (c), (d), (e), (f), or (h) of this section, the sampling site shall be located after the last recovery device (if any recovery devices are present) but prior to the inlet of any control device that is present, and prior to release to the atmosphere.

(2) *Sampling site when a halogen reduction device is used prior to a combustion device.* An owner or operator using a scrubber or other halogen reduction device to reduce the process vent halogen atom mass emission rate to less than 0.45 kilogram per hour (0.99 pound per hour) prior to a combustion control device in compliance with § 65.63(b)(2) shall determine the halogen atom mass emission rate prior to the combustor and after the scrubber or other halogen reduction device according to the procedures in paragraph (g) of this section.

(3) *Sampling site selection method.* Method 1 or 1A of appendix A of 40 CFR part 60, as appropriate, shall be used for selection of the sampling site. No traverse site selection method is needed for process vents smaller than 0.10 meter (4 inches) in nominal inside diameter.

(c) *TOC or HAP concentration.* The TOC or HAP concentrations used for TRE index value calculations in paragraph (h) of this section shall be determined based on paragraph (c)(1) or (i) of this section, or any other method or data that have been validated according to the protocol in Method 301 of appendix A of 40 CFR part 63. For concentrations needed for comparison with the appropriate concentration in table 1 of this subpart, TOC or HAP concentration shall be determined based on paragraph (c)(1), (c)(2), or (i) of this section or any other method or data that have been validated according to the protocol in Method 301 of appendix A of 40 CFR part 63. The owner or operator shall record the TOC or HAP concentration as specified in § 65.66(c).

(1) *Method 18.* The procedures specified in paragraph (c)(1)(i) and (ii) of this section shall be used to calculate parts per million by volume concentration using Method 18 of appendix A of 40 CFR part 60.

(i) 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.

(ii) The concentration of either TOC (minus methane and ethane) or organic HAP emissions shall be calculated using the following two procedures, as applicable.

(A) The TOC concentration (C_{TOC}) is the sum of the concentrations of the individual components and shall be computed for each run using Equation 64–1 of this section:

$$C_{TOC} = \frac{\sum_{i=1}^{x}\left(\sum_{j=1}^{n} C_{ji}\right)}{x} \qquad \text{(Eq. 64-1)}$$

Where:

C_{TOC} = Concentration of TOC (minus methane and ethane), dry basis, parts per million by volume.

x = Number of samples in the sample run.

n = Number of components in the sample.

C_{ji} = Concentration of sample component j of the sample i, dry basis, parts per million by volume.

(B) The total organic HAP concentration (C_{HAP}) shall be computed according to the equation in paragraph (c)(1)(ii)(A) of this section except that only the organic HAP species shall be summed.

(2) *Method 25A.* The following procedures shall be used to calculate parts per million by volume concentration using Method 25A of appendix A of 40 CFR part 60:

(i) Method 25A of appendix A of 40 CFR part 60 shall be used only if a single organic compound of regulated material is greater than 50 percent of total organic HAP or TOC, by volume, in the process vent.

(ii) The process vent composition may be determined by either process knowledge, test data collected using an appropriate EPA method, or a method or data validated according to the protocol in Method 301 of appendix A of 40 CFR part 63. 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 conditions.

(iii) The organic compound used as the calibration gas for Method 25A of appendix A of 40 CFR part 60 shall be the single organic compound of regulated material present at greater than 50 percent of the total organic HAP or TOC by volume.

(iv) The span value for Method 25A of appendix A of 40 CFR part 60 shall be equal to the appropriate concentration value in table 1 to this subpart.

(v) Use of Method 25A of appendix A of 40 CFR part 60 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.

(vi) The owner or operator shall demonstrate that the concentration of TOC including methane and ethane measured by Method 25A of appendix A of 40 CFR part 60 is below one-half the appropriate value in table 1 to this subpart to be considered a Group 2B vent with an organic HAP or TOC concentration below the appropriate value in table 1 to this subpart.

(d) *Volumetric flow rate.* The process vent volumetric flow rate (Q_S) in standard cubic meters per minute at 20 °C (68 °F) shall be determined as specified in paragraphs (d)(1) and (2) of this section and shall be recorded as specified in § 65.66(b):

(1) Use Method 2, 2A, 2C, or 2D of appendix A of 40 CFR part 60, as appropriate. If the process vent tested passes through a final steam jet ejector and is not condensed, the stream volumetric flow shall be corrected to 2.3 percent moisture; or

(2) The engineering assessment procedures in paragraph (i) of this section can be used for determining volumetric flow rates.

(e) *Heating value.* The net heating value shall be determined as specified in paragraphs (e)(1) and (2) of this section or by using the engineering assessment procedures in paragraph (i) of this section.

(1) The net heating value of the process vent shall be calculated using Equation 64–2 of this section:

$$H_T = K_1\left(\sum_{j=1}^{n} D_j H_j\right) \qquad \text{(Eq. 64-2)}$$

Where:

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

K_1 = Constant, 1.740×10^{-7} (parts per million)$^{-1}$ (gram-mole per standard cubic meter) (megajoule per kilocalorie), where standard temperature for (gram-mole per standard cubic meter) is 20 °C.

n = Number of components in the sample.

D_j = Concentration on a wet basis of compound j in parts per million as measured by procedures indicated in paragraph (e)(2) of this section. For process vents that pass through a final steam jet and are not condensed, the moisture is assumed to be 2.3 percent by volume.

H_j = Net heat of combustion of compound j, kilocalorie per gram-mole, based on combustion at 25 °C and 760 millimeters of mercury. The heat of combustion of process vent components shall be determined using American Society for Testing and Materials (ASTM) D2382–76 (incorporated by reference as specified in §65.13) if published values are not available or cannot be calculated.

(2) The molar composition of the process vent (D_j) shall be determined using the following methods:

(i) Method 18 of appendix A of 40 CFR part 60 to measure the concentration of each organic compound.

(ii) American Society for Testing and Materials (ASTM) D1946–77 (incorporated by reference as specified in §65.13) to measure the concentration of carbon monoxide and hydrogen.

(iii) Method 4 of appendix A of 40 CFR part 60 to measure the moisture content of the stack gas.

(f) *TOC or HAP emission rate.* The emission rate of TOC (minus methane and ethane) (E_{TOC}) and/or the emission rate of total organic HAP (E_{HAP}) in the process vent as required by the TRE index value equation specified in paragraph (h) of this section, shall be calculated using Equation 64.3 of this section:

$$E = K_2 \left(\sum_{j=1}^{n} C_j M_j \right) Q_s \qquad \text{(Eq. 64-3)}$$

Where:

E = Emission rate of TOC (minus methane and ethane) (E_{TOC}) or emission rate of total organic HAP (E_{HAP}) in the sample, kilograms per hour.

K_2 = Constant, 2.494×10^{-6} (parts per million) (gram-mole per standard cubic meter) (kilogram per gram) (minutes per hour), where standard temperature for (gram-mole per standard cubic meter) is 20 °C.

n = Number of components in the sample.

C_j = Concentration on a dry basis of organic compound j in parts per million as measured by Method 18 of appendix A of 40 CFR part 60 as indicated in paragraph (c) of this section. If the TOC emission rate is being calculated, C_j includes all organic compounds measured minus methane and ethane; if the total organic HAP emission rate is being calculated, only organic HAP compounds are included.

M_j = Molecular weight of organic compound j, gram/gram-mole.

Q_s = Process vent flow rate, dry standard cubic meter per minute, at a temperature of 20 °C.

(g) *Halogenated vent determination.* In order to determine whether a process vent is halogenated, the mass emission rate of halogen atoms contained in organic compounds shall be calculated according to the procedures specified in paragraphs (g)(1) and (2) of this section. A process vent is considered halogenated if the mass emission rate of halogen atoms contained in the organic compounds is equal to or greater than 0.45 kilogram per hour (0.99 pound per hour).

(1) The process vent concentration of each organic compound containing halogen atoms (parts per million by volume, by compound) shall be determined based on one of the following procedures:

(i) Process knowledge that no halogen or hydrogen halides are present in the process vent; or

(ii) Applicable engineering assessment as discussed in paragraph (i)(3) of this section; or

(iii) Concentration of organic compounds containing halogens measured by Method 18 of appendix A of 40 CFR part 60; or

(iv) Any other method or data that have been validated according to the applicable procedures in Method 301 of appendix A of 40 CFR part 63.

(2) Equation 64–4 of this section shall be used to calculate the mass emission rate of halogen atoms:

$$E = K_2 Q \left(\sum_{j=1}^{n} \sum_{i=1}^{m} C_j * L_{j,i} * M_{j,i} \right) \qquad \text{(Eq. 64-4)}$$

Where:

E = Mass of halogen atoms, dry basis, kilogram per hour.

K_2 = Constant, 2.494×10^{-6} (parts per million)$^{-1}$ (kilogram-mole per standard cubic meter) (minute per hour), where standard temperature is 20 °C.

Q = Flow rate of gas stream, dry standard cubic meters per minute, determined according to paragraph (d) or (i) of this section.

n = Number of halogenated compounds j in the gas stream.

j = Halogenated compound j in the gas stream.

m = Number of different halogens i in each compound j of the gas stream.

i = Halogen atom i in compound j of the gas stream.

C_j = Concentration of halogenated compound j in the gas stream, dry basis, parts per million by volume.

L_{ji} = Number of atoms of halogen i in compound j of the gas stream.

M_{ji} = Molecular weight of halogen atom i in compound j of the gas stream, kilogram per kilogram-mole.

(h) *TRE index value.* The owner or operator shall calculate the TRE index value of the process vent using the equations and procedures specified in paragraphs (h)(1) through (3) of this section, as applicable, and shall maintain the records specified in § 65.66(a) or § 65.66(d)(4), as applicable.

(1) *TRE index value equation.* Equation 64–5 of this section shall be used to calculate the TRE index:

$$TRE = A * [B + C + D + E + F] \qquad \text{(Eq. 64-5)}$$

Where:

TRE = TRE index value.

A, B, C, D, E, and F = Parameters presented in tables 2 and 3 of this subpart that include the following variables:

Q = Process vent flow rate, standard cubic meters per minute, at a standard temperature of 20 °C, as calculated according to paragraph (d) or (i) of this section.

H = Process vent net heating value, megajoules per standard cubic meter, as calculated according to paragraph (e) or (i) of this section.

E_{TOC} = Emission rate of TOC (minus methane and ethane), kilograms per hour, as calculated according to paragraph (f) or (i) of this section.

E_{HAP} = Emission rate of total organic HAP, kilograms per hour, as calculated according to paragraph (f) or (i) of this section.

(2) *Nonhalogenated process vents.* The owner or operator of a nonhalogenated process vent shall calculate the TRE index value using either one of the following procedures, as applicable:

(i) *TRE calculations: Part 60 regulated sources.* Use the parameters in table 2 to this subpart and calculate the TRE index value twice, once using the appropriate equation (depending on the heating value and flow rate of the process vent) in equations 15 through 30 and once using the appropriate equation (depending on the heating value of the process vent) in equations 31 and 32. Select the lowest TRE index value.

(ii) *TRE calculations: Part 63 regulated sources.* Use the equation and parameters in table 3 to this subpart and calculate the TRE index value using equations 34, 35, and 36 for process vents at existing sources; or equations 38, 39, and 40 for process vents at new sources. Select the lowest TRE index value.

(3) *Halogenated process vents.* The owner or operator of a halogenated process vent stream as determined according to procedures specified in paragraph (g) of this section shall calculate the TRE index value using either one of the following procedures, as applicable:

(i) *TRE Calculations: Part 60 regulated sources.* Use the parameters in table 2 to this subpart and calculate the TRE index value using the appropriate equation chosen from equations 1 through 14 depending on the heating value and flow rate of the process vent.

(ii) *TRE calculations: Part 63 regulated sources.* Use the appropriate parameters in table 3 to this subpart and calculate the TRE index value using equation 33 or 37 depending on whether the process vent is at a new or existing source.

(i) *Engineering assessment.* For purposes of TRE index value determination, engineering assessment may be used to determine process vent flow rate, net heating value, TOC emission rate, and total organic HAP emission rate for the representative operating condition expected to yield the lowest TRE index value. Engineering assessments shall meet the requirements of paragraphs (i)(1) through (4) of this section. If process vent flow rate or process vent organic HAP or TOC concentration is being determined for comparison with the 0.011 scmm (0.40 standard cubic foot) flow rate or the applicable concentration value in table 1 to this subpart, engineering assessment may be used to determine the flow rate or concentration for the representative operating condition expected to yield the highest flow rate or concentration.

(1) If the TRE index value calculated using such engineering assessment and the TRE index value equation in paragraph (h) of this section is greater than 4.0, then the owner or operator is not required to perform the measurements specified in paragraphs (c) through (g) of this section.

(2) If the TRE index value calculated using such engineering assessment and the TRE index value equation in paragraph (h) of this section is less than or equal to 4.0, then the owner or operator is required either to perform the measurements specified in paragraphs (c) through (g) of this section for group determination or to consider the process vent a Group 1 process vent and comply with the requirement (or standard) specified in §65.63(a) and, if applicable, §65.63(b).

(3) Engineering assessment includes, but is not limited to, the examples specified in paragraphs (i)(3)(i) through (iv) of this section.

(i) Previous test results provided the tests are representative of current operating practices at the process unit.

(ii) Bench-scale or pilot-scale test data representative of the process under representative operating conditions.

(iii) Maximum flow rate, TOC emission rate, organic HAP emission rate, organic HAP or TOC concentration, or net heating value limit specified or implied within a permit limit applicable to the process vent.

(iv) Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties. Examples of analytical methods include, but are not limited to, the following examples:

(A) Use of material balances based on process stoichiometry to estimate maximum TOC or organic HAP concentrations;

(B) Estimation of maximum flow rate based on physical equipment design such as pump or blower capacities;

(C) Estimation of TOC or organic HAP concentrations based on saturation conditions; and

(D) Estimation of maximum expected net heating value based on the stream concentration of each organic compound or, alternatively, as if all TOC in the stream were the compound with the highest heating value.

(4) All data, assumptions, and procedures used in the engineering assessment shall be documented. The owner or operator shall maintain the records specified in §65.66(a), (b), (c), or (d), as applicable.

§65.65 Monitoring.

(a) An owner or operator of a Group 2A process vent maintaining a TRE index value greater than 1.0 without a recovery device shall monitor based on the approved plan as specified in §65.63(d).

(b) As required in §65.63(a) and (c), an owner or operator of a Group 2A process vent maintaining a TRE index value greater than 1.0 with a recovery device or a Group 1 process vent shall comply with §65.142(b).

§65.66 Recordkeeping provisions.

(a) *TRE index value records.* The owner or operator shall maintain records of measurements, engineering assessments, and calculations performed to determine the TRE index value of the process vent according to the procedures of §65.64(h), including those records associated with halogen vent stream determination. Documentation of engineering assessments shall include all data, assumptions, and