

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### AIR QUALITY DIVISION

#### PART 11. CONTINUOUS EMISSION MONITORING

(By authority conferred on the director of the department of environmental quality by sections 5503 and 5512 of 1994 PA 451, MCL 324.5503 and 324.5512, and Executive Reorganization Order No. 1995-18, MCL 324.99903)

#### **R 336.2101 Continuous emission monitoring, fossil fuel-fired steam generators.**

Rule 1101. (1) Except as specified in R 336.2199, the owner or operator of any fossil fuel-fired steam generator that has an annual average capacity factor of more than 30%, as reported to the federal power commission for calendar year 1974, or as otherwise determined by the department, shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of all of the following:

(a) Opacity, if the generator has more than 250,000,000 Btu's per hour heat input, unless gaseous fuel is the only fuel burned, or unless oil or a mixture of gas and oil are the only fuels burned and the source is able to comply with the applicable particulate matter and opacity standards without utilization of particulate matter collection equipment, and where the source has never been found from any administrative or judicial proceedings to be in violation of the applicable visible emission standard.

(b) Sulfur dioxide, if the generator has a per hour heat input of more than 250,000,000 Btu's and if sulfur dioxide emission control equipment has been installed.

(c) Nitrogen oxides if the generator has a per hour heat input of more than 1,000,000,000 Btu's, is subject to a nitrogen oxides emission standard, and is located in an air quality control region that has been determined by the administrator of the United States environmental protection agency to require a control strategy for nitrogen oxides, unless the owner or operator demonstrates, by source emission compliance tests, that the source emits nitrogen oxides at levels 30% or more below the applicable nitrogen oxide emission standard.

(d) Oxygen or carbon dioxide percentage, if measurement of oxygen or carbon dioxide in the flue gas is required to convert either sulfur dioxide or nitrogen oxides continuous emission monitoring data to units of the applicable emission standard.

(2) The owner or operator of any source subject to subrule (1) of this rule shall complete the installation and performance tests of the equipment required by subrule (1) of this rule and shall begin monitoring and recording within 18 months of the effective date of this rule.

History: 1980 AACCS; 2002 AACCS.

**R 336.2102 Continuous emission monitoring; sulfuric acid-producing facilities.**

Rule 1102. (1) Except as provided in R 336.2199, the owner or operator of any sulfuric acid plant having a production capacity of more than 300 tons per day, the production capacity being expressed as 100% acid, shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of sulfur dioxide for each sulfuric acid-producing facility within such plant.

(2) The owner or operator of any source subject to the provisions of subrule (1) shall complete the installation and performance tests of the equipment required by subrule (1) and shall begin monitoring and recording within 18 months from the effective date of this rule.

History: 1980 AACS.

**R 336.2103 Continuous emission monitoring, fluid bed catalytic cracking unit catalyst regenerators at petroleum refineries.**

Rule 1103. (1) Except as provided in R 336.2199, the owner or operator of any fluid bed catalytic cracking unit catalyst regenerator at a petroleum refinery having a per day fresh feed capacity of more than 20,000 barrels shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of opacity.

(2) The owner or operator of any source subject to the provisions of subrule (1) shall complete the installation and performance tests of the equipment required by subrule (1) and shall begin monitoring and recording within 18 months from the effective date of this rule.

History: 1980 AACS.

**R 336.2103a Applicability of rules for mercury emissions.**

Rule 1103a. (1) R 336.2104 and R 336.2160 do not apply to affected EGUs for which the federal MATS, adopted by reference in R 336.2502, is an applicable requirement relative to emissions of mercury.

(2) If the federal MATS ceases to be an applicable requirement as to affected EGUs, R 336.2104 and R 336.2160 shall apply beginning with the third calendar month following the termination of the federal MATS as an applicable requirement or April 16, 2015, whichever is later.

(3) R 336.2104 and R 336.2160 are rescinded 60 days after the entry of a final judgment or order from which no further appeal or review is taken or available in *White Stallion v EP*, No. 12-1100 (D.C. Circuit), upholding the provisions of the federal MATS relative to emissions of mercury.

History: 2014 AACS.

**R 336.2104 Continuous emission monitoring; coal-fired electric generating units at a power plant.**

Rule 1104. Unless the federal MATS is an applicable requirement, an affected EGU shall meet both of the following requirements:

(a) Except as provided in R 336.2160, a unit that serves a generator with a nameplate capacity of more than 25 megawatts producing electricity for sale shall install, calibrate, maintain, and operate a continuous monitoring system or a sorbent trap monitoring system for the measurement of mercury.

(b) The owner or operator of any source subject to the provisions of subdivision (a) of this rule shall complete the installation and performance tests of the equipment required by subdivision (a) of this rule and shall begin monitoring and recording by April 16, 2015.

History: 2009 AACCS; 2014 AACCS.

**R 336.2150 Performance specifications for continuous emission monitoring systems.**

Rule 1150. (1) The monitoring equipment required by R 336.2101, R 336.2102, R 336.2103, and R 336.2104 shall be demonstrated by the owners or operators of the monitoring equipment to meet all of the following performance specifications:

(a) Continuous monitoring systems for measuring opacity shall comply with performance specification 1 of appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(b) Continuous monitoring systems for measuring nitrogen oxides shall comply with performance specification 2 of appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(c) Continuous monitoring systems for measuring sulfur dioxide shall comply with performance specification 2 of appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(d) Continuous monitoring systems for measuring oxygen shall comply with performance specification 3 of appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(e) Continuous monitoring systems for measuring carbon dioxide shall comply with performance specification 3 of appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(f) Continuous monitoring for measuring stack gas volumetric flow shall comply with the requirements of 40 C.F.R. Part 75, §75.20(c) and appendix A and B, adopted by reference in R 336.1802a, or performance specification 6 of appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(g) Continuous monitoring for total vapor phase mercury emissions using a sorbent trap monitoring system shall comply with performance specification 12B of Appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(h) Continuous monitoring for total vapor-phase mercury emissions using a mercury continuous emission monitoring system shall comply with performance specification 12A of Appendix B to 40 C.F.R. Part 60, adopted by reference in R 336.1299.

(i) ASTM D6784-02, “Standard Test Method for Elemental, Oxidized, Particle Bound and Total Mercury in Flue Gas Generated from Coal Fired Stationary Sources (Ontario Hydro Method).”

(2) The test method in subrule (1)(i) of this rule is adopted by reference. A copy of the test method ASTM D6784-02 is available for inspection and purchase at the Department of Environmental Quality, Air Quality Division, 525 West Allegan Street, P.O. Box 30260, Lansing, Michigan 48909-7760, at a cost as of the time of adoption of this rule of \$57.00. A copy may also be obtained from the ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428-2959; the ASTM website at [www.astm.org](http://www.astm.org) or ASTM customer service at [service@astm.org](mailto:service@astm.org); at a cost of the time of adoption of this rule of \$47.00.

History: 1980 AACS; 1989 AACS; 2002 AACS; 2009 AACS; 2014 AACS.

### **R 336.2151 Calibration gases for continuous emission monitoring systems.**

Rule 1151. (1) For nitrogen oxide monitoring systems installed on fossil fuel-fired steam generators, the pollutant gas used to prepare calibration gas mixtures shall be nitric oxide.

(2) For sulfur dioxide monitoring systems installed on fossil fuel-fired steam generators or sulfuric acid plants, the pollutant gas used to prepare calibration gas mixtures shall be sulfur dioxide.

(3) Span and zero gases shall be traceable to national bureau of standards reference gases when these reference gases are available. Every 6 months from the date of manufacture, span and zero gases shall be reanalyzed by conducting triplicate analyses using the reference method in appendix A of 40 C.F.R. Part 60, adopted by reference in R 336.1299, as follows:

(a) For sulfur dioxide, use reference method 6.

(b) For nitrogen oxides, use reference method 7.

(c) For carbon dioxide and oxygen, use reference method 3. The gases may be analyzed at less frequent intervals if longer shelf lives are guaranteed by the manufacturer.

History: 1980 AACS; 1989 AACS; 2014 AACS.

### **R 336.2152 Cycling time for continuous emission monitoring systems.**

Rule 1152. (1) Continuous monitoring systems for measuring opacity shall complete a minimum of 1 cycle of sampling and analyzing for each successive 10-second period and 1 cycle of data recording for each successive 6-minute period.

(2) Continuous monitoring systems for measuring oxides of nitrogen, carbon dioxide, oxygen, or sulfur dioxide shall complete a minimum of 1 cycle of operation for each successive 15-minute period.

History: 1980 AACS.

**R 336.2153 Zero and drift for continuous emission monitoring systems.**

Rule 1153. (1) The owner or operator of any continuous emission monitoring system required by this part shall do all of the following:

(a) Subject the instruments to the manufacturer's recommended zero and span check at least once daily, unless the manufacturer has recommended adjustments at shorter intervals, in which case such recommendations shall be followed.

(b) Adjust the zero and span when the 24-hour zero drift or 24-hour calibration drift limits of the applicable performance specifications in appendix B of 40 C.F.R. Part 60, adopted by reference in R 336.1299, are exceeded.

(2) Calibration gases used pursuant to the provisions of subrule (1) of this rule shall meet the requirements of R 336.2151.

History: 1980 AACCS; 1989 AACCS; 2014 AACCS.

**R 336.2154 Instrument span for continuous emission monitoring systems.**

Rule 1154. Instrument span shall be approximately 200% of the expected instrument data display output corresponding to the emission standard for the source.

History: 1980 AACCS.

**R 336.2155 Monitor location for continuous emission monitoring systems.**

Rule 1155. (1) The owner or operator of a source subject to provisions of this part shall install the required continuous monitoring systems or monitoring devices such that representative measurements of emissions or process parameters from the affected facility are obtained.

(2) When the effluents from 2 or more affected facilities of similar design and operating characteristics are combined before being released into the atmosphere, the owner or operator of a source subject to the provisions of this part may install monitoring systems on the combined effluent. When the affected facilities are not of similar design and operating characteristics, or when the effluent from 1 affected facility is released into the atmosphere through more than 1 point, the owner or operator shall establish alternate procedures to implement the intent of these requirements subject to approval by the department.

History: 1980 AACCS; 2002 AACCS; 2014 AACCS.

**R 336.2156 Performance testing notifications; monitoring notification.**

Rule 1156. The owner or operator of any source required to install a continuous emission monitor by R 336.2101, R 336.2102, R 336.2103, or R 336.2104 shall submit to the department all of the following:

(a) A source-specific monitoring plan not less than 60 days prior to performance specification testing of the monitoring system for the review and approval of the department.

(b) A site-specific test plan not less than 30 days prior to the performance specification testing of the monitoring system for review and approval of the department.

(c) All results of performance specification testing not more than 60 days after the last date of the test.

History: 2009 AACS.

**R 336.2157 Quality assurance requirements for continuous emission monitoring systems.**

Rule 1157. (1) The monitoring equipment required by R 336.2101, R 336.2102, R 336.2103, and R 336.2104 shall perform continuing quality control procedures in accordance with Part 60 Appendix F, adopted by reference in R 336.1299. Monitors installed and certified in accordance with Part 74 Appendix A, adopted by reference in R 336.1802a, and meeting the continuing quality control requirements of Part 75 Appendix B are exempt from the requirements of Part 60 Appendix F.

(2) A continuous stack gas volumetric flow monitor installed for R 336.2104 shall perform continuing quality control in accordance with the applicable quality control and quality assurance requirements of 40 C.F.R. §75.21 and Part 75 Appendix B or Part 60 Appendix F.

History: 2009 AACS; 2014 AACS.

**R 336.2158 Rescinded.**

History: 2009 AACS; 2014 AACS.

**R 336.2159 Alternative continuous emission monitoring systems.**

Rule 1159. The department may provide approval for alternative monitoring systems that do not comply with the requirements of this part, if the owner or operator demonstrates both of the following:

(a) That an equivalent alternative emission monitoring system shall be implemented that satisfies the intent of the requirements of this part.

(b) That 1 of the following conditions exists:

(i) A continuous emission monitoring system that conforms with the requirements of this part will not provide an accurate determination of emissions.

(ii) The affected source is operated less than 1 month per year.

(iii) A continuous emission monitoring system that conforms with the requirements of this part cannot be installed due to physical limitations of the source.

History: 1980 AACS; 2002 AACS.

**R 336.2160 Mercury low mass emitter monitoring methodology.**

Rule 1160. (1) Unless the federal MATS is an applicable requirement, beginning April 16, 2015, the monitoring methodology shall meet all of the requirements of this rule.

(2) The owner or operator of an affected unit that emits less than 464 ounces (29 pounds) of mercury per year may use the mercury low mass emitter monitoring methodology after performing initial certification testing. The owner or operator of the affected unit shall perform the initial certification testing and ongoing quality assurance as described in subrules (2) and (3) of this rule. The initial test shall be performed within 60 days of the effective date of these rules or 90 days prior to the compliance date, whichever is later.

(3) For the initial certification testing, the following shall apply:

(a) The owner or operator shall perform mercury emission testing to determine the mercury concentration, for example, total vapor-phase mercury, in the effluent.

(b) Testing shall be performed using 1 of the following mercury reference methods: ASTM D6784-02, adopted by reference in R 336.2150, Method 29, method 30A, or method 30B of Part 60, adopted by reference in R 336.1299. A test shall consist of a minimum of 3 runs at maximum routine load while firing fuel or fuels with the highest mercury content.

(c) The minimum run time shall be 1 hour if method 30A is used. If method 29, ASTM D6784-02, or method 30B is used, paired samples are required for each test run and the runs shall be long enough to ensure that sufficient mercury is collected to analyze. When method 29 or ASTM D6784-02 is used the test results shall be based on the vapor-phase mercury collected in the back half of the sampling train. For each method 29, ASTM D6784-02, or method 30B test run, the paired trains shall meet the relative deviation requirement specified in method 30B. If the relative deviation specification is met, the result of the 2 samples shall be averaged arithmetically.

(d) If the unit is equipped with flue gas desulfurization or add-on mercury emission controls, the controls shall be operating normally during the testing, and for the purpose of establishing proper operation of the controls, parametric data shall be recorded.

(e) A complete test plan and test notification shall be provided to the department 30 days prior to the testing.

(4) Based on the results of emission testing, the following equation shall be used to provide a conservative estimate of the annual mercury mass emissions for the unit:

$$E = N \cdot K \cdot CHg \cdot Q_{mass}$$

Where:

E = Estimated annual mercury mass emissions in ounces per year.

N = 8760 hours or the maximum number of operating hours per year allowed by the unit's federally enforceable permit.

K =  $9.978 \times 10^{-10}$  ounces-scm/ $\mu$ g-standard cubic foot (scf).

CHg = Highest mercury concentration ( $\mu$ g/scm) from any test run or 0.05  $\mu$ g/scm, whichever is greater.

Q<sub>mass</sub> = Maximum potential flow rate.

(a) If the estimated annual mercury mass emissions are 464 ounces per year or less, the unit is eligible to use the monitoring methodology of this rule, and mercury continuous emission monitoring is not required.

(b) The results of the testing performed under this rule shall be submitted as a certification application to the department, not later than 45 days after the test is completed. The calculations demonstrating that the unit emits less than 464 ounces per year shall be provided, and the default mercury concentration that will be used for mercury mass emission reporting shall be specified.

(c) Following initial certification the following steps shall be taken:

(i) The default mercury concentration used to estimate the unit's annual mercury mass emissions shall be reported for each unit operating hour and shall be used to calculate hourly mercury emissions.

(ii) The mercury emission testing described in this rule shall be repeated periodically for the purpose of quality assurance, as follows:

(A) If the results of the certification testing under this rule show that the unit emits 144 ounces (9 pounds) per year or less, the first retest is required by the end of the fourth quarter following the calendar quarter of the certification test.

(B) If the results of the certification test under this section show that the unit emits more than 144 ounces per year but less than 464 ounces per year, the first retest is required by the end of the second quarter following the calendar quarter of the certification test.

(C) Retesting shall be required either by the end of the second or fourth quarter following the quarter of the previous test, depending on the results of the previous test. To determine whether the next retest is required within 2 or 4 quarters, substitute the highest mercury concentration from the current test or 0.50 µg/scm, whichever is greater, into the equation under subrule (3) of the rule. If the estimated annual mass emissions exceed 144 ounces, the next test is due within 2 quarters. If the estimated annual mass emissions are 144 ounces or less, the next test is due within 4 quarters.

(d) The updated mercury default concentration shall be applied beginning with the first unit operating hour after the completion of the retest.

(e) If the unit is equipped with flue gas desulfurization system or add-on mercury controls, the owner or operator shall record the parametric data for each unit operating hour.

(f) An additional retest is required when there is a change in coal rank of the primary fuel or other significant fuel change.

(g) At the end of each calendar year, if the cumulative annual mercury mass emission from an affected unit exceeds 464 ounces, the owner or operator shall install, certify, operate, and maintain a mercury continuous emission monitoring system, or sorbent trap monitoring system, not later than 180 days after the end of the calendar year in which the emissions exceeded 464 ounces.

History: 2009 AACS; 2014 AACS.

### **R 336.2161 Rescinded.**

History: 2009 AACS; 2014 AACS.



**R 336.2170 Monitoring data reporting and recordkeeping.**

Rule 1170. (1) The owner or operator of any continuous emission monitoring system required by this part shall submit to the department, within 30 days of the end of a calendar quarter, a written report for each calendar quarter which shall include all of the following information:

(a) Excess emissions and the nature and cause of the excess emissions, if known, as follows:

(i) For opacity measurements, the report shall consist of the magnitude, in actual percent opacity, of all 6-minute averages of opacity more than the applicable opacity standard for each hour of operation (all allowable exceptions are to be deducted before determining the excess averages of opacity). Average values shall be obtained by integration over the averaging period or by arithmetically averaging a minimum of 24 equally spaced, instantaneous opacity measurements per 6 minutes.

(ii) For gaseous measurements, the report shall consist of emission averages, in the units of the applicable standard, for each averaging period during which the applicable standard was exceeded.

(b) The date and time identifying each period during which the continuous monitoring system was inoperative, except for zero and span checks, and the nature of repairs or adjustments made.

(c) If the continuous monitoring system has been inoperative, repaired, or adjusted, and if no excess emissions occurred, include a statement attesting to this fact.

(2) The owner or operator of any continuous emission monitoring system required by this part shall maintain a file of all information reported in the quarterly reports and all other data collected, either by the continuous monitoring system or as necessary to convert monitoring data to the units of the applicable standard, for a minimum of 2 years from the date of collection of the data or submission of the reports.

History: 1980 AACCS; 2002 AACCS; 2014 AACCS.

**R 336.2175 Data reduction procedures for fossil fuel-fired steam generators.**

Rule 1175. (1) The owner or operator of a fossil fuel-fired steam generator that is subject to the provisions of this part shall convert gaseous emission monitoring data in parts per million to pounds per million Btu's using either of the following procedures:

(a) When the owner or operator elects to measure oxygen in the flue gases, the measurements of the pollutant concentration and oxygen concentration shall each be on a consistent basis (wet or dry). When measurements are on a dry basis, the following conversion procedure shall be used:

$$E = CF \left( \frac{20.9}{20.9 - \%O_2} \right)$$

When measurements are on a wet basis, alternative procedures approved by the department shall be used.

(b) When the owner or operator elects to measure carbon dioxide in the flue gases, the measurements of the pollutant concentration and carbon dioxide concentration shall each be on a consistent basis (wet or dry) and the following conversion procedure shall be used:

$$E = CF_c \left( \frac{100}{\%CO_2} \right)$$

(2) The values used in the equations in subrule (1) of this rule shall be derived as follows:

(a) "E" is the pollutant emission in pounds per million Btu's.

(b) "C" is the pollutant concentration in pounds per dry standard cubic foot determined by multiplying the average concentration, in parts per million, for each hourly period by  $2.59 \times 10^{-9} M$  pounds per dry standard cubic foot per part per million where M is the pollutant molecular weight in pounds per pound mole (M equals 64.07 for sulfur dioxide and 46.01 for oxides of nitrogen).

(c) "% O<sub>2</sub>" or "% CO<sub>2</sub>" is the oxygen or carbon dioxide volume, expressed as percent, determined with equipment required by R 336.2101.

(d) "F" or "Fc" is a factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted (F) or a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted (Fc). Values of F and Fc are listed in the standards of performance for new stationary sources, 40 C.F.R. §60.45(f), adopted by reference in R 336.1299.

History: 1980 AACCS; 1989 AACCS; 2002 AACCS; 2014 AACCS.

Editor's Note: An obvious error in R 336.2175 was corrected at the request of the promulgating agency, pursuant to Section 56 of 1969 PA 306, as amended by 2000 PA 262, MCL 24.256. The rule containing the error was published in *Michigan Register*, 2014 MR 9. The memorandum requesting the correction was published in *Michigan Register*, 2014 MR 9.

### **R 336.2176 Data reduction procedures for sulfuric acid plant.**

Rule 1176. The owner or operator of a sulfuric acid plant that is subject to the provisions of this part shall do both of the following:

(a) Establish a conversion factor 3 times daily according to the procedures in the standards of performance for new stationary sources, 40 C.F.R. Part 60.84(b), adopted by reference in R 336.1299.

(b) Multiply the conversion factor by the average sulfur dioxide concentration in the flue gases to obtain the average sulfur dioxide emissions in pounds per short ton.

History: 1980 AACCS; 1989 AACCS; 2014 AACCS.

### **R 336.2189 Alternative data reporting or reduction procedures.**

Rule 1189. The department may provide approval for alternative data reporting or reduction procedures that do not comply with the requirements of this

part if the owner or operator demonstrates, to the satisfaction of the department, that the procedures are at least as accurate as the procedures identified in this part.

History: 1980 AACRS; 2002 AACRS.

**R 336.2190 Monitoring system malfunctions.**

Rule 1190. The monitoring and reporting requirements of this part shall not apply during any period of monitoring system malfunction if the source owner or operator demonstrates both of the following to the satisfaction of the department:

- (a) That the cause of the malfunction could not have been avoided by any course of action that could have reasonably been expected of the owner or operator.
- (b) That the necessary repairs are being made as expeditiously as practicable.

History: 1980 AACRS; 2002 AACRS.

**R 336.2199 Exemptions from continuous emission monitoring requirements.**

Rule 1199. The requirements of R 336.2101, R 336.2102, and R 336.2103 do not apply to either of the following:

- (a) A source subject to a new source performance standard promulgated in the standards of performance for new stationary sources, 40 C.F.R. Part 60, adopted by reference in R 336.1299.
- (b) A source is not subject to an applicable emission standard.

History: 1980 AACRS; 1989 AACRS; 1997 AACRS; 2014 AACRS.