[**Note:** This is one of two options proposed for comment. Based on the comments we receive on this proposal, we will promulgate either Option 1 or Option 2.]

[Option 1]

For the reasons stated in the preamble, title 40, chapter I, parts 60 and 63 of the Code of the Federal Regulations are proposed to be amended as follows:

PART 60–[AMENDED]

1. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C 7401, et seq.

2. Section 60.17 is amended by adding paragraph (a)(65) to read as follows:

§60.17 Incorporation by Reference.

* * * * *

(a)(65) 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), for appendix B to part 60, Performance Specification 12A.

3. Appendix B to part 60 is amended by adding in numerical order new Performance Specification 12A to read as follows:

PERFORMANCE SPECIFICATION 12A - SPECIFICATIONS AND TEST PROCEDURES FOR TOTAL VAPOR PHASE MERCURY CONTINUOUS EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES

1.0 Scope and Application.

1.1 Analyte.

Analyte	CAS No.
Mercury (Hg)	7439-97-6

1.2 Applicability.

1.2.1 This specification is for evaluating the acceptability of total vapor phase Hg continuous emission monitoring systems (CEMS) installed on the exit gases from fossil fuel fired boilers at the time of or soon after installation and whenever specified in the regulations. The Hg CEMS must be capable of measuring the total concentration in $\mu g/m^3$ (regardless of speciation) of vapor phase Hg, and recording that concentration on a dry basis, corrected to 20 degrees C and 7 percent CO_2. Particle bound Hg is not included. The CEMS must include a) a diluent (CO_2) monitor, which must meet Performance Specification 3 in 40 CFR part 60, appendix B, and b) an automatic sampling system. Existing diluent and flow monitoring equipment can be used.

This specification is not designed to evaluate an installed CEMS’s performance over an extended period of time nor does it identify specific calibration techniques and auxiliary procedures to assess the CEMS’s performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS properly. The Administrator may require, under CAA section 114, the operator to conduct CEMS performance evaluations at other times besides the initial test to evaluate the CEMS performance. See 40 CFR 60.13(c).

2.0 Summary of Performance Specification.

Procedures for measuring CEMS relative accuracy, measurement error and drift are outlined. CEMS installation and measurement location specifications, and data reduction procedures are included. Conformance of the CEMS with the Performance Specification is determined.

3.0 Definitions.

3.1 Continuous Emission Monitoring System (CEMS) means the total equipment required for the determination of a pollutant concentration. The system consists of the following major subsystems:

3.2 Sample Interface means that portion of the CEMS used for one or more of the following: sample acquisition, sample transport, sample conditioning, and protection of the monitor from the effects of the stack effluent.

3.3 Hg Analyzer means that portion of the CEMS that measures the total vapor phase Hg mass concentration and generates a proportional output.

3.4 Diluent Analyzer (if applicable) means that portion of the CEMS that senses the diluent gas (CO_2) and generates an output proportional to the gas concentration.

3.5 Data Recorder means that portion of the CEMS that provides a permanent electronic record of the analyzer output. The data recorder can provide automatic data reduction and CEMS control capabilities.

3.6 Span Value means the upper limit of the intended Hg concentration measurement range. The span value is a value equal to two times the emission standard.

3.7 Measurement Error (ME) means the difference between the concentration indicated by the CEMS and the known concentration generated by a reference gas when the entire CEMS, including the sampling interface, is challenged. An ME test procedure is performed to document the accuracy and linearity of the CEMS at several points over the measurement range.

3.8 Upscale Drift (UD) means the difference in the CEMS output responses to a Hg reference gas when the entire CEMS, including the sampling interface, is challenged after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.9 Zero Drift (ZD) means the difference in the CEMS output responses to a zero gas when the entire CEMS, including the sampling interface, is challenged after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.10 Relative Accuracy (RA) means the absolute mean difference between the pollutant concentration(s) determined by the CEMS and the value determined by the reference method (RM) plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests or the applicable emission limit.

4.0 Interferences. [Reserved]

5.0 Safety.

The procedures required under this performance specification may involve hazardous materials, operations, and equipment. This performance specification may not address all of the safety problems associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures. The CEMS user’s manual and materials recommended by the reference method should be consulted for specific precautions to be taken.

6.0 Equipment and Supplies.

6.1 CEMS Equipment Specifications.

6.1.1 Data Recorder Scale. The CEMS data recorder output range must include zero and a high level value. The high level value must be approximately 2 times the Hg concentration corresponding to the emission standard level for the stack gas under the circumstances existing as the stack gas is sampled. If a lower high level value is used, the CEMS must have the capability of providing multiple high level values (one of which is equal to the span value) or be capable of automatically changing the high level value as required (up to specified high level value) such that the measured value does not exceed 95 percent of the high level value.

6.1.2 The CEMS design should also provide for the determination of response drift at both the zero and mid-level value. If this is not possible or practical, the design must allow these determinations to be conducted at a low-level value (zero to 20 percent of the high-level value) and at a value between 50 and 100 percent of the high-level value.

6.2 Reference Gas Delivery System. The reference gas delivery system must be designed so that the flowrate of reference gas introduced to the CEMS is the same at all three challenge levels specified in Section 7.1 and at all times exceeds the flow requirements of the CEMS.

6.3 Other equipment and supplies, as needed by the applicable reference method used. See Section 8.6.2.

7.0 Reagents and Standards.

7.1 Reference Gases.

7.1.1 Zero - N_2 or Air. Less than 0.1 µg Hg/m^3.

7.1.2 Mid-level Hg^0 and $HgCl_2$. 40 to 60 percent of span.

7.1.3 High-level Hg^0 and $HgCl_2$. 80 to 100 percent of span.

7.2 Reagents and Standards. May be required for the reference methods. See Section 8.6.2.

8.0 Performance Specification Test Procedure.

8.1 Installation and Measurement Location Specifications.

8.1.1 CEMS Installation. Install the CEMS at an accessible location downstream of all pollution control equipment. Since the Hg CEMS sample system normally extracts gas from a single point in the stack, use a location that has been shown to be free of stratification for SO_2 and NO_x through concentration measurement traverses for those gases. If the cause of failure to meet the RA test requirement is determined to be the measurement location and a satisfactory correction technique cannot be established, the Administrator may require the CEMS to be relocated.

Measurement locations and points or paths that are most likely to provide data that will meet the RA requirements are listed below.

8.1.2 Measurement Location. The measurement location should be (1) at least eight equivalent diameters downstream of the nearest control device, point of pollutant generation, bend, or other point at which a change of pollutant concentration or flow disturbance may occur, and (2) at least two equivalent diameters upstream from the effluent exhaust. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, Method 1.

8.1.3 Hg CEMS Sample extraction Point. Use a sample extraction point (1) no less than 1.0 meter from the stack or duct wall, or (2) within the centroidal velocity traverse area of the stack or duct cross section.

8.2 Reference Method (RM) Measurement Location and Traverse Points. The RM measurement location should be at a point or points in the same stack cross sectional area as the CEMS is located, according to the criteria above. The RM and CEMS locations need not be immediately adjacent. They should be as close as possible without causing interference with one another.

8.3 Measurement Error (ME) Test Procedure. The Hg CEMS must be constructed to permit the introduction of known (NIST traceable) concentrations of elemental mercury (Hg^0) and mercuric chloride ($HgCl_2$) separately into the sampling system of the CEMS immediately preceding the sample extraction filtration system such that the entire CEMS can be challenged. Inject sequentially each of the three reference gases (zero, mid-level, and high level) for each Hg species. CEMS measurements of each reference gas shall not differ from their respective reference values by more than 5 percent of the span value. If this specification is not met, identify and correct the problem before proceeding.

8.4 Upscale Drift (UD) Test Procedure.

8.4.1 UD Test Period. While the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart, determine the magnitude of the UD once each day (at 24-hour intervals) for 7 consecutive days according to the procedure given in Sections 8.4.2 through 8.4.3.

8.4.2 The purpose of the UD measurement is to verify the ability of the CEMS to conform to the established CEMS response used for determining emission concentrations or emission rates. Therefore, if periodic automatic or manual adjustments are made to the CEMS zero and response settings, conduct the UD test immediately before these adjustments, or conduct it in such a way that the UD can be determined.

8.4.3 Conduct the UD test at the mid-level point specified in Section 7.1. Evaluate upscale drift for elemental Hg (Hg^0) only. Introduce the reference gas to the CEMS. Record the CEMS response and subtract the reference value from the CEM value (see example data sheet in Figure 12A-1).

8.5 Zero Drift (ZD) Test Procedure.

8.5.1 ZD Test Period. While the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart, determine the magnitude of the ZD once each day (at 24-hour intervals) for 7 consecutive days according to the procedure given in Sections 8.5.2 through 8.5.3.

8.5.2 The purpose of the ZD measurement is to verify the ability of the CEMS to conform to the established CEMS response used for determining emission concentrations or emission rates. Therefore, if periodic automatic or manual adjustments are made to the CEMS zero and response settings, conduct the ZD test immediately before these adjustments, or conduct it in such a way that the ZD can be determined.

8.5.3 Conduct the ZD test at the zero level specified in Section 7.1. Introduce the zero gas to the

CEMS. Record the CEMS response and subtract the zero value from the CEM value (see example data sheet in Figure 12A-1).

8.6 Relative Accuracy (RA) Test Procedure.

8.6.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.6.2 through 8.6.6 while the affected facility is operating at normal full load, or as specified in an applicable subpart. The RA test can be conducted during the UD test period.

8.6.2 Reference Method (RM). Unless otherwise specified in an applicable subpart of the regulations, use either Method 29 in appendix A to 40 CFR part 60, or ASTM Method D 6784-02 (incorporated by reference in §60.17) as the RM for Hg. Do not include the filterable portion of the sample when making comparisons to the CEMS results. Conduct all RM tests with paired or duplicate sampling systems.

8.6.3 Sampling Strategy for RM Tests. Conduct the RM tests in such a way that they will yield results representative of the emissions from the source and can be compared to the CEMS data. It is preferable to conduct the diluent (if applicable), moisture (if needed), and Hg measurements simultaneously. However, diluent and moisture measurements that are taken within an hour of the Hg measurements can used to adjust the results to a consistent basis. In order to correlate the CEMS and RM data properly, note the beginning and end of each RM test period for each paired RM run (including the exact time of day) on the CEMS chart recordings or other permanent record of output.

8.6.4 Number and length of RM Tests. Conduct a minimum of nine paired sets of all necessary RM test runs that meet the relative standard deviation criteria of this PS. Use a minimum sample run time of 2 hours for each pair.

NOTE: More than nine paired sets of RM tests can be performed. If this option is chosen, test results can be rejected so long as the total number of paired RM test results used to determine the CEMS RA is greater than or equal to nine. However, all data must be reported, including the rejected data.

8.6.5 Correlation of RM and CEMS Data. Correlate the CEMS and the RM test data as to the time and duration by first determining from the CEMS final output (the one used for reporting) the integrated average pollutant concentration or emission rate for each pollutant RM test period. Consider system response time, if important, and confirm that the results are on a consistent moisture, temperature, and diluent concentration basis with the paired RM test. Then, compare each integrated CEMS value against the corresponding average of the paired RM values.

8.6.6 Paired RM Outliers.

8.6.6.1 Outliers are identified through the determination of precision and any systematic bias of the paired RM tests. Data that do not meet this criteria should be flagged as a data quality problem. The primary reason for performing dual RM sampling is to generate information to quantify the precision of the RM data. The relative standard deviation (RSD) of paired data is the parameter used to quantify data precision. Determine RSD for two simultaneously gathered data points as follows:

$$RSD = 100\% * \left| \left(Ca - Cb \right) \right| / \left(Ca + Cb \right)$$

Eq. 12A-1

where Ca and Cb are concentration values determined from trains A and B respectively. For RSD calculation, the concentration units are unimportant so long as they are consistent.

8.6.6.2 A minimum precision criteria for RM Hg data is that RSD for any data pair must be ≤10 percent as long as the mean Hg concentration is greater than 1.0 μg/m^3. If the mean Hg concentration is less than or equal to 1.0 μg/m^3, the RSD must be ≤20 percent. Pairs of RM data exceeding these RSD criteria should be eliminated from the data set used to develop a Hg CEMS correlation or to assess CEMS RA.

8.6.7 Calculate the mean difference between the RM and CEMS values in the units of the emission standard, the standard deviation, the confidence coefficient, and the RA according to the procedures in Section 12.0.

8.7 Reporting. At a minimum (check with the appropriate EPA Regional Office, State, or local Agency for additional requirements, if any), summarize in tabular form the results of the RD tests and the RA tests or alternative RA procedure, as appropriate. Include all data sheets, calculations, charts (records of CEMS responses), reference gas concentration certifications, and any other information necessary to confirm that the performance of the CEMS meets the performance criteria.

9.0 Quality Control. [Reserved]

10.0 Calibration and Standardization. [Reserved]

11.0 Analytical Procedure.

Sample collection and analysis are concurrent for this Performance Specification (see Section 8.0). Refer to the RM employed for specific analytical procedures.

12.0 Calculations and Data Analysis.

Summarize the results on a data sheet similar to that shown in Figure 2-2 for Performance Specification 2.

12.1 Consistent Basis. All data from the RM and CEMS must be on a consistent dry basis and, as applicable, on a consistent diluent basis. Correct the RM and CEMS data for moisture and diluent as follows:

12.1.1 Moisture Correction (as applicable). Correct each wet RM run for moisture with the corresponding Method 4 data; correct each wet CEMS run using the corresponding CEMS moisture monitor date using Equation 12A-2.

$$\text{Concentration}_{(dry)} = \frac{\text{Concentration}_{(wet)}}{(1 - B_{ws})} \qquad \text{Eq. 12A-2}$$

12.1.2 Correction to Units of Standard (as applicable). Correct each dry RM run to the units of the emission standard with the corresponding Method 3B data;

correct each dry CEMS run using the corresponding CEMS diluent monitor data as follows:

12.1.3 Correct to Diluent Basis. The following is an example of concentration (ppm) correction to 7 percent oxygen.

$$ppm_{(corr)} = ppm_{(uncorr)} \left[\frac{20.9 - 7.0}{20.9 - \%O_{2\,(dry)}} \right] \quad \text{Eq. 12A-3}$$

The following is an example of mass/gross calorific value (lbs/million Btu) correction.

lbs/MMBtu = $Conc_{(dry)}$ (F-factor) ((20.9/(20.9 - percent O_2))

12.2 Arithmetic Mean. Calculate the arithmetic mean of the difference, d, of a data set as follows:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^{n} d_i \qquad \text{Eq. 12A-4}$$

Where:

n = Number of data points.

12.3 Standard Deviation. Calculate the standard deviation, S_d, as follows:

$\sum_{i=1}^{n} d_i$ = Algebraic summation of the individual differences

12.4 Confidence Coefficient. Calculate the 2.5

$$s_d = \left[\frac{\sum\limits_{i=1}^{n} d_i^2 - \frac{\left[\sum\limits_{i=1}^{n} d_i\right]^2}{n}}{n-1}\right]^{\frac{1}{2}} \qquad \textbf{Eq. 12A-5}$$

$$RA = \frac{|\bar{d}| + |CC|}{\overline{RM}} \times 100 \qquad \textbf{Eq. 12A-7}$$

percent error confidence coefficient (one-tailed), CC, as follows:

$$CC = t_{0.975} \frac{s_d}{\sqrt{n}} \qquad \textbf{Eq. 12A-6}$$

12.5 Relative Accuracy. Calculate the RA of a set of data as follows:

where:

Where:

$|\bar{d}|$ = Absolute value of the mean differences (from Equation 12A-4).

$|CC|$ = Absolute value of the confidence coefficient (from Equation 12A-6).

$\overline{RM}$ = Average RM value. In cases where the average emissions for the test are less than 50 percent of the applicable standard, substitute the emission standard value in the denominator of Eq. 12A-7 in place of $\overline{RM}$. In all other cases, use $\overline{RM}$.

13.0 Method Performance.

13.1 Measurement Error (ME). ME is assessed at mid-level and high-level values as given below using standards for both Hg^0 and $HgCl_2$. The mean difference between the indicated CEMS concentration and the reference concentration value for each standard shall be no greater than 5 percent of span. The same difference for the zero reference gas shall be no greater than 5 percent of span.

13.2 Upscale Drift (UD). The CEMS design must allow the determination of UD of the analyzer. The CEMS response can not drift or deviate from the benchmark value of the reference standard by more than 5 percent of span for the mid level value. Evaluate upscale drift for Hg^0 only.

13.3 Zero Drift (ZD). The CEMS design must allow the determination of drift at the zero level. This drift shall not exceed 5 percent of span.

13.4 Relative Accuracy (RA). The RA of the CEMS must be no greater than 20 percent of the mean value of the RM test data in terms of units of the emission standard, or 10 percent of the applicable standard, whichever is greater.

14.0 Pollution Prevention. [Reserved]

15.0 Waste Management. [Reserved]

16.0 Alternative Procedures. [Reserved]

17.0 Bibliography.

17.1 40 CFR part 60, appendix B, “Performance Specification 2 - Specifications and Test Procedures for SO_2 and NO_X Continuous Emission Monitoring Systems in Stationary Sources”.

17.2 40 CFR part 60, appendix A, “Method 29 - Determination of Metals Emissions from Stationary Sources”.

17.3 ASTM Method 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)”.

18.0 Tables and Figures.

TABLE 12A-1. t-VALUES.

n^a	$t_{0.975}$	n^a	$t_{0.975}$	n^a	$t_{0.975}$
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145

6	2.571	11	2.228	16	2.131

[a] The values in this table are already corrected for n-1 degrees of freedom. Use n equal to the number of individual values.

	Day	Date and Time	Reference Value (C)	CEMS Value (M)	Measurement Error	Drift
Zero Level						
Mid-level						
High-level						

Figure 12A-1. Zero and Upscale Drift Determination.

PART 63--[AMENDED]

4. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401, et seq.

5. Section 63.14 is amended by adding paragraph (b)(35) to read as follows:

§63.14 Incorporation by Reference.

* * * * *

(b)(35) 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), for appendix B to part 63, Method 324.

6. Part 63 is amended by adding subpart UUUUU to read as follows:

Subpart UUUUU–National Emission Standards for Hazardous Air Pollutants for Coal- or Oil-Fired Electric Utility Steam Generating Units

Sec.

What this Subpart Covers

Emissions Limitations

General Compliance Requirements

Initial Compliance Requirements

Continuous Compliance Requirements

Notifications, Reports, and Records

Other Requirements and Information

Tables to Subpart UUUUU of Part 63

Table 1 to Subpart UUUUU of Part 63--Performance Test Requirements for Ni or Hg
Table 2 to Subpart UUUUU of Part 63--Initial Compliance With Emissions Limitations for Ni or Hg
Table 3 to Subpart UUUUU of Part 63--Continuous Compliance with Emissions Limitations for Ni or Hg
Table 4 to Subpart UUUUU of Part 63--Applicability of General Provisions to Subpart UUUUU

WHAT THIS SUBPART COVERS

§63.9980 What is the purpose of this subpart?

This subpart establishes national emissions limitations for hazardous air pollutants (HAP) emitted from coal-fired electric utility steam generating units and oil-fired electric utility steam generating units. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emissions limitations.

§63.9981 Am I subject to this subpart?

You are subject to this subpart if you own or operate a coal-fired electric utility steam generating unit or an oil-fired electric utility steam generating unit.

§63.9982 What parts of my facility does this subpart cover?

(a) The affected source is each group of one or more coal- or oil-fired electric utility steam generating units located at a facility.

An electric utility steam generating unit that combusts natural gas at greater than or equal to 98 percent of the unit’s annual fuel consumption is not an affected source under this subpart.

(b) A coal or oil-fired electric utility steam generating unit is a new affected source if you commenced construction of the unit after [INSERT DATE OF PUBLICATION OF THE PROPOSED RULE IN THE FEDERAL REGISTER].

(c) An affected source is reconstructed if you meet the criteria as defined in §63.2. An existing electric utility steam generating unit that is switched completely to burning a different coal rank or fuel type is considered to be an existing affected source under this subpart.

(d) An affected source is existing if it is not new or reconstructed.

§63.9983 When do I have to comply with this subpart?

(a) If you have a new or reconstructed affected source, you must comply with this subpart according to paragraph (a)(1) or (2) of this section.

(1) If you start up your affected source before

[DATE THE FINAL RULE IS PUBLISHED IN THE FEDERAL REGISTER], then you must comply with the emissions limitations and work practice standards for new and reconstructed sources in this subpart no later than [DATE THE FINAL RULE IS PUBLISHED IN THE FEDERAL REGISTER].

(2) If you startup your affected source on or after [DATE THE FINAL RULE IS PUBLISHED IN THE FEDERAL REGISTER], then you must comply with the emissions limitations and work practice standards for new and reconstructed sources in this subpart upon startup of your affected source.

(b) If you have an existing affected source, you must comply with the emissions limitations for existing sources no later than 3 years after [DATE THE FINAL RULE IS PUBLISHED IN THE FEDERAL REGISTER].

(c) You must meet the notification requirements according to the schedule applicable to your facility as specified in §63.10300 and in subpart A of this part. Some of the notifications must be submitted before you are required to comply with the emissions limitations in this subpart.

EMISSIONS LIMITATIONS

§63.9990 What emissions limitations must I meet for

coal-fired electric utility steam generating units?

(a) For each coal-fired electric utility steam generating unit other than an integrated gasification combined-cycle (IGCC) electric utility steam generating unit, you must meet the mercury (Hg) emissions limit in paragraphs (a)(1) through (5) of this section that applies to your unit. The Hg emissions limits in paragraphs (a)(1) through (5) of this section are based on a 12-month rolling average using the procedures in §63.10009.

(1) For each coal-fired electric utility steam generating unit that burns only bituminous coal, you must meet the Hg emissions limit in either paragraph (a)(1)(i) or (ii) of this section that applies to you.

(i) You must not discharge into the atmosphere from an existing affected source any gases which contain Hg in excess of 2.0 pound per trillion British thermal unit (lb/TBtu) on an input basis or 21×10^{-6} pound per Megawatt hour (lb/MWh) on an output basis.

(ii) You must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 6.0×10^{-6} lb/MWh on an output basis.

(2) For each coal-fired electric utility steam

generating unit that burns only subbituminous coal, you must meet the Hg emissions limit in either paragraph (a)(2)(i) or (ii) of this section that applies to you.

(i) You must not discharge into the atmosphere any gases from an existing affected source which contain Hg in excess of 5.8 lb/TBtu on an input basis or 61×10^{-6} lb/MWh on an output basis.

(ii) You must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 20×10^{-6} lb/MWh on an output basis.

(3) For each coal-fired electric utility steam generating unit that burns only lignite coal, you must meet the Hg emissions limit in either paragraph (a)(3)(i) or (ii) of this section that applies to you.

(i) You must not discharge into the atmosphere any gases from an existing affected source which contain Hg in excess of 9.2 lb/TBtu on an input basis or 98×10^{-6} lb/MWh on an output basis.

(ii) You must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 62×10^{-6} lb/MWh on an output basis.

(4) For each coal-burning electric utility steam generating unit that burns only coal refuse, you must

meet the Hg emissions limit in either paragraph (a)(4)(i) or (ii) of this section that applies to you.

(i) You must not discharge into the atmosphere any gases from an existing affected source which contain Hg in excess of 0.38 lb/TBtu on an input basis or 4.1 x 10^{-6} lb/MWh on an output basis.

(ii) You must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 1.1 x 10^{-6} lb/MWh on an output basis.

(5) For each coal-fired electric utility steam generating unit that burns a blend of coals from different coal ranks (i.e., bituminous coal, subbituminous coal, lignite) or a blend of coal and coal refuse, you must not discharge into the atmosphere any gases from a new or existing affected source that contain Hg in excess of the monthly unit-specific Hg emissions limit established according to paragraph (a)(5)(i) or (ii) of this section, as applicable to your unit.

(i) If you operate a coal-fired electric utility steam generating unit that burns a blend of coals from different coal ranks or a blend of coal and coal refuse, you must not discharge into the atmosphere any gases from a new or existing affected source that contain Hg in excess of the computed weighted Hg emissions limit based on the proportion of energy output (in Btu) contributed by each coal type burned during the compliance period and its applicable Hg emissions limit in paragraphs (a)(1) through (4) of this section as determined using Equation 1 of this section. You must meet the weighted Hg emissions limit calculated using Equation 1 of this section by calculating the unit emission rate based on the total Hg loading of the unit and the total Btu or megawatt hours contributed by all fuels burned during the compliance period.

$$EL_b = \frac{\sum_{i=1}^{n} EL_i(HH_i)}{\sum_{i=1}^{n} HH_i} \qquad \text{(Eq. 1)}$$

Where:

EL_b = Total allowable Hg in lb/MWh (or lb/TBtu) that can be emitted to the atmosphere from any affected source being averaged under the blending provision.

EL_i = Hg emissions limit for the subcategory that applies to affected source i, lb/MWh (or lb/TBtu).

HH_i = Heat input to, or electricity output from, affected source i during the production period related to the corresponding H_i that falls within the compliance period, gross

MWh generated or MMBtu heat input to the electric utility steam generating unit.

n = Number of coal ranks being averaged for an affected source.

(ii) If you operate a coal-fired electric utility steam generating unit that burns a blend of coals from different coal ranks or a blend of coal and coal refuse together with one or more non-regulated, supplementary fuels, you must not discharge into the atmosphere any gases from the unit that contain Hg in excess of the computed weighted Hg emission limit based on the proportion of energy output (in Btu) contributed by each coal type burned during the compliance period and its applicable Hg emissions limit in paragraphs (a)(1) through (4) of this section as determined using Equation 1 of this section. You must meet the weighted Hg emissions limit calculated using Equation 1 of this section by calculating the unit emission rate based on the total Hg loading of the unit and the total Btu or megawatt hours contributed by both regulated and nonregulated fuels burned during the compliance period.

(b) For each IGCC electric utility steam generating unit, you must meet the Hg emissions limit in either paragraph (b)(1) or (2) of this section that applies to you. The Hg emissions limits in this paragraph are based on a 12-month rolling average using the procedures in §63.10009.

(1) You must not discharge into the atmosphere any gases from an existing affected source which contain Hg in excess of 19 lb/TBtu on an input basis or 200 x 10^{-6} lb/MWh on an output basis.

(2) You must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 20 x 10^{-6} lb/MWh on an output basis.

§63.9991 What emissions limitations must I meet for oil-fired electric utility steam generating units?

(a) For each oil-fired electric utility steam generating unit, you must meet the nickel (Ni) emissions limit in paragraphs (a)(1) and (2) of this section that applies to you, except as provided in paragraph (b) of this section.

(1) You must not discharge into the atmosphere any gases from an existing affected source which contain Ni in excess of 210 lb/TBtu on an input basis or 0.002 lb/MWh on an output basis.

(2) You must not discharge into the atmosphere any gases from a new affected source which contain Ni in excess of 0.0008 lb/MWh on an output basis.

(b) The emissions limit in paragraph (a) of this section does not apply to a new or existing oil-fired electric utility steam generating unit if during the reporting period, to burn 98 percent or more distillate oil exclusively as the fuel for the unit. The emissions limit in paragraph (a) of this section will apply immediately if you subsequently burn a fuel other than distillate oil in the unit.

(c) If you use an electrostatic precipitator (ESP) to meet the applicable Ni emissions limit, you must operate the ESP such that the hourly average voltage and secondary current (or total power input) do not fall below the limit established in the initial or subsequent performance test.

(d) If you use a control device or combination of control devices other than an ESP to meet the applicable Ni emissions limit, or you wish to establish and monitor an alternative operating limit and alternative monitoring parameters for an ESP, you must apply to the Administrator for approval of alternative monitoring under §63.8(f).

§63.9992 What are my compliance options for multiple affected sources?

(a) If you have two or more coal-fired electric utility steam generating units at your facility that are subject to Hg emission limits in §63.9990, you may choose to use the emissions averaging compliance approach specified in paragraph (b) of this section as an alternative to complying with the applicable Hg emission limits for each individual unit. You may use emissions averaging only under the conditions specified in paragraphs (a)(1) and (2) of this section.

(1) The emissions averaging compliance approach is applicable to coal-fired electric utility steam generating units subject to the Hg emission limits for existing affected sources under this subpart that are located at a common contiguous facility. The emissions averaging compliance approach is also applicable to coal-fired electric utility stream generating units subject to the Hg emission limits for new affected sources under this subpart as long as they meet the new source limits specified under this subpart.

(2) All of the Hg emission limits used for the emissions averaging compliance approach must meet the applicable limits expressed in the same format (i.e., all of the Hg emission limits must be either the applicable

lb/TBtu limit values or the applicable lb/MWh limit values).

(b) If you choose to use the emissions averaging compliance approach, you must meet the requirements specified in paragraphs (b)(1) through (5) of this section.

(1) You must designate your emissions averaging source group by identifying each of the existing coal-fired electric utility stream generating units at your facility site to be included in your emissions averaging source group.

(2) You must designate a common Hg emissions limit format to be used for all of the coal-fired electric utility stream generating units in your designated emissions averaging source group (either the lb/TBtu limit format or the lb/MWh limit format).

(3) You must determine the Hg emissions limit value in §63.9990 for your selected format that is applicable to each of the individual coal-fired electric utility stream generating units in your designated emissions averaging source group.

(4) You must calculate the unit-specific Hg emissions limit for your designated emissions averaging

source group using Equation 1 of this section.

$$AvEL = \frac{\sum_{i=1}^{n} L_i(V_i)}{\sum_{i=1}^{n} V_i} \qquad \text{(Eq. 1)}$$

Where:

AvEL = Total allowable Hg that can be emitted to the atmosphere from all emission sources in the emissions averaging group, lb/MWh or lb/TBtu;

L_i = Hg emissions limit for the subcategory that applies to emission source i or the calculated emissions limit derived for an emissions averaging group using Equation 1 of this section, lb/MWh or lb/MMBtu;

V_i = Volume of production for emissions source i during the production period related to the corresponding L_i that falls within the 12-month compliance period, gross MWh generated or MMBtu heat input to the electric utility steam generating unit; and

n = Number of emissions sources being averaged. This number may apply to individual emissions sources or emissions averaging groups.

(5) You must not discharge into the atmosphere any gases from your designated emissions averaging group that contain Hg in excess of the unit-specific Hg emissions limit established according to paragraph (b)(4) of this section as determined based on a 12-month rolling average using the procedures in §63.10009.

(c) You may use the emissions averaging compliance approach or revise an existing emissions averaging group at any time after the compliance date by submitting an emissions averaging plan or revision, respectively, using the title V operating permit amendment process specified by the regulating authority. The emissions averaging plan must contain the information specified in paragraphs (c)(1) and (2) of this section.

(1) Identification of each coal-fired electric utility steam generating unit in your designated emissions averaging group and the applicable Hg emissions limit for each unit as determined in paragraph (b) of this section.

(2) The Hg emissions limit for your designated emissions averaging group as determined in paragraph (b) of this section, including all calculations and supporting information.

GENERAL COMPLIANCE REQUIREMENTS

§63.10000 What are my general requirements for complying with this subpart?

(a) You must be in compliance with the emissions limitations (including operating limits) in this subpart at all times, except during periods of startup, shutdown, and malfunction.

(b) You must always operate and maintain your affected source, including air pollution control and monitoring equipment, according to the provisions in §63.6(e)(1)(i).

(c) For each monitoring system required by this subpart, you must develop and submit to the Administrator for approval a unit-specific monitoring plan according to the requirements in §63.10008(f).

(d) You must conduct a performance evaluation of each continuous monitoring system (CMS) in accordance with your unit-specific monitoring plan.

(e) You must operate and maintain the CMS in continuous operation according to the unit-specific monitoring plan.

(f) You must develop and implement a written startup, shutdown, and malfunction plan (SSMP) according to the provisions in §63.6(e)(3).

INITIAL COMPLIANCE REQUIREMENTS

§63.10005 By what date must I conduct performance tests or other initial compliance demonstrations?

(a) For each existing affected source, you must conduct performance tests, set operating limits, and conduct monitoring equipment performance evaluations, as applicable to your source, by the compliance date that is specified for your source in §63.9983 and according to the applicable provisions in §63.7(a)(2).

(b) For each new affected source, you must conduct performance tests, set operating limits, and conduct monitoring equipment performance evaluations, as applicable to your source, within 180 days after the compliance date that is specified for your source in §63.9983 and according to the provisions in §63.7(a)(2).

§63.10006 When must I conduct subsequent performance tests?

For each affected oil-fired electric utility steam generating units subject to a Ni emissions limit in this subpart, you must conduct a subsequent performance test at least once each year to demonstrate compliance and include the results in the next semiannual compliance report.

§63.10007 What performance test procedures must I use?

(a) For each affected oil-fired electric utility steam generating unit subject to a Ni emissions limit under this subpart, you must conduct each performance test to demonstrate compliance with the applicable emissions limit according to the requirements in paragraphs (a)(1) through (4) of this section.

(1) You must conduct each performance test according to §63.7(c), (d), (f), and (h) and the procedures in Table 1 to this subpart. You must also develop a site-specific test plan according to the requirements in §63.7(c).

(2) You must conduct each performance test at the representative process operating conditions that are expected to result in the highest emissions of Ni, and you must demonstrate initial compliance and establish your operating limits based on this test.

(3) You may not conduct performance tests during periods of startup, shutdown, or malfunction.

(4) You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour.

(b) You must submit a Notification of Compliance Status report containing the results of the initial or annual compliance demonstration according to the requirements in §63.10031(b).

§63.10008 What are my monitoring, installation,

operation, and maintenance requirements?

(a) If you use an ESP to meet a Ni limit in this subpart, you must install and operate a continuous parameter monitoring system (CPMS) to measure and record the voltage and secondary current (or total power input) to the control device.

(b) You must install, operate, and maintain each CPMS by the compliance date specified in §63.9983 according to the requirements in paragraphs (b)(1) through (3) of this section.

(1) Each CPMS must complete a minimum of one cycle of operation for each successive 15-minute period. You must have a minimum of four successive cycles of operation to have a valid hour of data.

(2) Each CPMS must determine the 1-hour block average of all recorded readings.

(3) You must record the results of each inspection, calibration, and validation check for a CPMS.

(c) You must install and operate a continuous emissions monitoring system (CEMS) to measure and record the concentration of Hg in the exhaust gases from each stack.

(d) You must install, operate, and maintain each

CEMS by the compliance date specified in §63.9983 according to the requirements in paragraphs (d)(1) through (4) of this section.

(1) You must install, operate, and maintain each CEMS according to Performance Specification 12A in 40 CFR part 60, appendix B.[1]

(2) You must conduct a performance evaluation of each CEMS according to the requirements of §63.8 and Performance Specification 12A in 40 CFR part 60, appendix B. id.

(3) You must operate each CEMS according to the requirements in paragraphs (d)(3)(i) through (iv) of this section.

(i) As specified in 63.8(c)(4)(ii), each CEMS must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.

(ii) You must reduce CEMS data as specified in §63.8(g)(2).

(iii) Each CEMS must determine and record the 1 hour average emissions using all the hourly averages

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[1] Performance Specification 12A is proposed elsewhere in today’s Federal Register.

collected for periods during which the CEMS is not out of control.

(iv) You must record the results of each inspection, calibration, and validation check.

(4) The provisions in paragraphs (d)(4)(i) through (iv) of this section apply to data collection periods for your Hg CEMS.

(i) A complete day of data for continuous monitoring is 18 hours or more in a 24-hour period.

(ii) A complete month of data for continuous monitoring is 21 days or more in a calendar month.

(iii) If you collect less than 21 days of continuous emissions data, you must discard the data collected that month and replace that data with the mean of the individual monthly emission rate values determined in the last 12 months.

(iv) If you collect less than 21 days per monthly period of continuous data again in that same 12-month rolling average cycle, you must discard the data collected that month and replace that data with the highest individual monthly emission rate determined in the last 12 months.

(e) As an alternative to the CEMS required in paragraph (c) of this section, the owner or operator must monitor Hg emissions using Method 324 in 40 CFR part 63, appendix A.[2]

(f) You must prepare and submit to the Administrator for approval a unit-specific monitoring plan for each monitoring system. You must comply with the requirements in your plan. The plan must address the requirements in paragraphs (f)(1) through (6) of this section.

(1) Installation of the CMS sampling probe or other interface at a measurement location relative to each affected process unit such that the measurement is representative of control of the exhaust emissions (e.g., at or downstream of the last control device);

(2) Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems;

(3) Performance evaluation procedures and acceptance criteria (e.g., calibrations);

(4) Ongoing operation and maintenance procedures in

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[2] Method 324 is proposed elsewhere in today’s _Federal Register_.

accordance with the general requirements of §63.8(c)(1), (3), and (4)(ii);

(5) Ongoing data quality assurance procedures in accordance with the general requirements of §63.8(d); and

(6) Ongoing recordkeeping and reporting procedures in accordance with the general requirements of §63.10(c), (e)(1) and (e)(2)(i).

<u>§63.10009 How do I demonstrate initial compliance with the emissions limitations</u>?

(a) You must demonstrate initial compliance with each emission limitation in §63.9990 that applies to you according to Table 2 to this subpart.

(b) If you elect to comply with an emissions limit using emissions averaging according to the requirements in §63.9992, you must demonstrate compliance with the emissions limit established for each emissions averaging group for the 12-month compliance period using Equation 1 of this section.

$$AvH = \frac{\sum_{i=1}^{n} H_i}{\sum_{i=1}^{n} V_i} \qquad \text{(Eq. 1)}$$

Where:

AvH = Total Hg emitted for the 12-month compliance period, lb/MWh or lb/MMBtu;

H_i = Total mass of measured Hg from AvEL emissions averaging group i during the 12-month compliance period, lb;

V_i = Total volume of production from AvEL emissions averaging group i during 12-month compliance period, gross MWh generated or MMBtu heat input to the electric utility steam generating unit; and

n = Number of emission sources in the emissions averaging group or number of emission averaging groups.

(c) If your affected electric utility steam generating unit is also a cogeneration unit, you must use the procedures in paragraphs (c)(1) and (2) of this section to calculate emission rates based on electrical output to the grid plus half of the equivalent electrical energy in the unit’s process stream.

(1) All conversions from Btu/hr unit input to MWe unit output must use equivalents found in 40 CFR part 60.40(a)(1) for electric utilities (i.e., 250 million Btu/hr input to a electric utility steam generating unit is equivalent to 73 MWe input to the electric utility steam generating unit); 73 MWe input to the electric utility steam generating unit is equivalent to 25 MWe output from the boiler electric utility steam generating unit; therefore, 250 million Btu input to the electric utility steam generating unit is equivalent to 25 MWe

output from the electric utility steam generating unit).

(2) You must use the Equation 2 of this section to determine the cogeneration Hg or Ni emission rate over a specific compliance period.

$$ER_{cogen} = \frac{E}{\left(\left(V_{grid}\right)+\left(\frac{V_{process}}{2}\right)\right)} \qquad \text{(Eq. 2)}$$

Where:

ER_{cogen} = Cogeneration Hg or Ni emission rate over a compliance period in lb/MWh (or lb Hg/TBtu);

E = Mass of Hg or Ni emitted from the stack over the same compliance period (lb Hg or lb Ni);

V_{grid} = Amount of energy sent to the grid over the same compliance period (MWh or TBtu); and

$V_{process}$ = Amount of energy converted to steam for process use over the same compliance period (MWh or TBtu).

(d) If your coal-fired electric utility steam generating unit is subject to an Hg limit in §63.9990, you must determine initial compliance according to the applicable requirements in paragraphs (d)(1) through (4) of this section.

(1) Begin compliance monitoring on the effective date of this subpart.

(2) If you use a CEMS, determine the 12-month

rolling average Hg emission rate according to the applicable procedures in paragraphs (d)(2)(i) through (iii) of this section.

(i) Calculate the total mass of Hg emissions over a month (M), in micrograms (μg), using Equation 3 of this section.

$$M = \int_0^t C(t)V(t)dt \qquad \text{(Eq. 3)}$$

Where:

M = Total mass of Hg emissions,(μg);
C = Concentration of Hg recorded by CEMS per Performance Specification 12A, micrograms per dry standard cubic meter (μg/dscm);
V = Volumetric flow rate recorded at the same frequency as the CEMS reading for the Hg concentration indicated in Performance Specification 12A, cubic meters per hour (dscm/hr); and
t = total time period over which mass measurements are collected, (hr).

(ii) Calculate the Hg emission rate for an input-based limit (lb/TBtu) using Equation 4 of this section.

$$ER = \frac{M \times \text{conversion factor}}{TP} \qquad \text{(Eq. 4)}$$

Where:

ER = Hg emission rate, (lb/TBtu);
M = Total mass of Hg emissions, micrograms

(μg);
Conversion factor = 2.205 x 10^{-9}, used to convert micrograms to pounds; and
$TP_{input-based}$ = Total power, (TBtu).

(iii) Calculate the Hg emission rate for an output-based limit (lb/MWh) using Equation 5 of this section:

$$ER = \frac{M \times \text{conversion factor}}{TP_{output-based}} \qquad \text{(Eq. 5)}$$

Where:

ER = Hg emission rate, (lb/MWh);
M = Total mass of Hg emissions, (μg);
Conversion factor = 2.205 x 10^{-9}; and
$TP_{output-based}$ = Total power, megawatt-hours (MWh).

(3) If you use Method 324 (40 CFR part 63, appendix A), determine the 12-month rolling average Hg emission rate according to the applicable procedures in paragraphs (d)(3)(i) through (v) of this section.

(i) Sum the Hg concentrations for the emission rate period, (μg/dscm).

(ii) Calculate the total volumetric flow for the emission rate period, (dscm).

(iii) Multiply the total Hg concentration times the total volumetric flow to obtain the total mass of Hg for the emissions rate period in micrograms.

(iv) Calculate the Hg emissions rate for an input-based limit (lb/TBtu) using Equation 4 of this section.

(v) Calculate the Hg emissions rate for an output-based limit (lb/MWh) using Equation 5 of this section.

(4) Report the 12-month rolling average Hg emissions rate in the first semiannual compliance report.

(e) If your oil-fired unit is subject to a Ni emissions limit in §63.9991, you must determine initial compliance using the applicable procedures in paragraphs (e)(1) through (3) of this section.

(1) Begin compliance monitoring on the effective date of this subpart.

(2) Use the applicable procedures in paragraphs (e)(2)(i) through (v) of this section to convert the Method 29 Ni measurement to the selected format.

(i) Sum the Ni concentrations obtained from the Method 29 test runs, milligrams per dscm (mg/dscm).

(ii) Calculate the total volumetric flow obtained during the Method 29 test runs, (dscm).

(iii) Multiply the total Ni concentration times the total volumetric flow for the duration of the initial compliance testing period to obtain the total mass of Ni in milligrams.

(iv) Calculate the input-based Ni emissions rate in a lb/TBtu format using Equation 6 of this section.

$$ER = \frac{M \times \text{conversion factor}}{TP_{\text{input-based}}} \quad \text{(Eq. 6)}$$

Where:

ER = Ni emissions rate, (lb/TBtu);
M = Total mass of Ni emissions, (mg);
Conversion factor = 2.205×10^{-6}, used to convert milligrams to pounds; and
$TP_{\text{input-based}}$ = Total power,(TBtu).

(v) Calculate the output-based Ni emissions rate in a lb/MWh format using Equation 7 of this section.

$$ER = \frac{M \times \text{conversion factor}}{TP_{\text{output-based}}} \quad \text{(Eq. 7)}$$

Where:

ER = Ni emissions rate, (lb/MWh);
M = Total mass of Ni emissions, (mg);
Conversion factor = 2.205×10^{-6}; and
$TP_{\text{output-based}}$ = Total power, (MWH).

(f) You must submit the Notification of Compliance Status report containing the results of the initial compliance demonstration according to the requirements in §63.10030(e).

CONTINUOUS COMPLIANCE REQUIREMENTS

§63.10020 How do I monitor and collect data to demonstrate continuous compliance?

(a) Except for monitor malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), you must monitor continuously (or collect data at all required intervals) at all times that the affected source is operating.

(b) You may not use data recorded during monitoring malfunctions, associated repairs, or required quality assurance or control activities, in data averages and calculations used to report emission or operating levels. You must use all the data collected during all other periods in assessing the operation of the control device and associated control system.

(c) A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions. Any period for which the monitoring system is out-of-control and data are not available for required calculations constitutes a deviation from the monitoring requirements.

§63.10021 How do I demonstrate continuous compliance with the emissions limitations?

(a) You must demonstrate continuous compliance with each emission limitation that applies to you according to the methods specified in Table 3 to this subpart.

(b) During periods of startup, shutdown, and malfunction, you must operate in accordance with the startup, shutdown, and malfunction plan as required in §63.10000(f).

(c) Consistent with §§63.6(e) and 63.7(e)(1), deviations that occur during a period of startup, shutdown, or malfunction are not violations if you demonstrate to the Administrator’s satisfaction that you were operating in accordance with the startup, shutdown, and malfunction plan. The Administrator will determine whether deviations that occur during a period of startup, shutdown, or malfunction are violations, according to the provisions in §63.6(e).

Notification, Reports, and Records

§63.10030 What notifications must I submit and when?

(a) You must submit all of the notifications in §§63.6(h)(4) and (5), 63.7(b) and (c), 63.8 (e), 63.8(f)(4) and (6), and 63.9(b) through (h) that apply to you by the dates specified. Except as provided in paragraph (f) of this section, if you comply with the requirements in §63.9991(b) for switching fuel, you must notify the Administrator in writing at least 30 days prior to using a fuel other than distillate oil.

(b) As specified in §63.9(b)(2), if you operate an affected source before [DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER], you must submit an Initial Notification not later than 120 days after [DATE THE FINAL RULE IS PUBLISHED IN THE FEDERAL REGISTER]. The Initial Notification must include the information required in paragraphs (b)(1) through (4) of this section, as applicable.

(1) The name and address of the owner or operator;

(2) The address (i.e., physical location) of the affected source;

(3) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source’s compliance date;

(4) A brief description of the nature, size, design and method of operation of the source and an identification of the types of emission points within the

affected source subject to the requirements and the Hg or Ni pollutant being emitted.

(c) If you startup your new or reconstructed affected source on or after [DATE THE FINAL RULE IS PUBLISHED IN THE FEDERAL REGISTER], you must submit an Initial Notification not later than 120 days after you become subject to this subpart. The Initial Notification must include the information required in paragraphs (c)(1) through (4) of this section, as applicable.

(1) The name and address of the owner or operator;

(2) The address (i.e., physical location) of the affected source;

(3) An identification of the relevant standard, or other requirement, that is the basis of the notification and the source’s compliance date;

(4) A brief description of the nature, size, design and method of operation of the source and an identification of the types of emission points within the affected source subject to the requirements and the Hg or Ni pollutant being emitted.

(d) If you are required to conduct a performance test, you must submit a notification of intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).

(e) If you are required to conduct a performance test or other initial compliance demonstration as specified in §63.10007, you must submit a Notification of Compliance Status report according to §63.9(h)(2)(ii) and the requirements specified in paragraphs (e)(1) through (3) of this section.

(1) For each initial compliance demonstration, you must submit the Notification of Compliance Status report, including all performance test results, before the close of business on the 60th day following the completion of the performance test and/or other initial compliance demonstrations according to §63.10(d)(2).

(2) The Notification of Compliance Status report must contain all the information specified in paragraphs (e)(2(i) through (iv) of this section, as applicable.

(i) A description of the affected source(s) including identification of which subcategory the source is in, the capacity of the source, a description of the add-on controls used on the source description of the fuel(s) burned, and justification for the worst-case fuel burned during the performance test.

(ii) Summary of the results of all performance tests, fuel analyses, and calculations conducted to demonstrate initial compliance including all established operating limits.

(iii) A signed certification that you have met all applicable emissions limitations, including any emission limitation for an emissions averaging group.

(iv) If you had a deviation from any emission limitation, you must also submit a description of the deviation, the duration of the deviation, and the corrective action taken in the Notification of Compliance Status report.

(f) If you comply with the requirements in §63.9991(b) by using distillate fuel, and you must switch fuel because of an emergency, you must notify the Administrator in writing within 30 days of using a fuel other than distillate oil.

§63.10031 What reports must I submit and when?

(a) Compliance report due dates. Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit a semiannual compliance report to the permitting authority according to the requirements in paragraphs (a)(1) through (5) of this section.

(1) The first compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.9983 and ending on June 30 or December 31, whichever date comes first after the compliance date that is specified for your affected source in §63.9983.

(2) The first compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date comes first after the first compliance report is due.

(3) Each subsequent compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) Each subsequent compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date comes first after the end of the semiannual reporting period.

(5) For each affected source that is subject to permitting regulations pursuant to 40 CFR part 70 or 40 CFR part 71, and if the permitting authority has established dates for submitting semiannual reports

pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), you may submit the first and subsequent compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (a)(1) through (4) of this section.

(b) *Compliance report contents.* The compliance report must contain the information required in paragraphs (b)(1) through (5) of this section and, as applicable, paragraphs (b)(6) through (10) of this section.

(1) Company name and address.

(2) Statement by a responsible official with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.

(3) Date of report and beginning and ending dates of the reporting period.

(4) A summary of the results of the annual performance tests and documentation of any operating limits that were reestablished during this test, if applicable.

(5) If you had a startup, shutdown, or malfunction

during the reporting period and you took actions consistent with your SSMP, the compliance report must include the information in §63.10(d)(5)(i).

(6) If there are no deviations from any emission limitation (emissions limit or operating limit) in this subpart that apply to you, a statement that there were no deviations from the emissions limitations during the reporting period.

(7) If there were no periods during which a CMS, including CEMS or CPMS, was out-of-control as specified in §63.8(c)(7), a statement that there were no periods during which the CMS were out-of-control during the reporting period.

(8) For each deviation from an emission limitation (emissions limit or operating limit) in this subpart that occurs at an affected source where you are not using a CMS to comply with that emission limitation, the compliance report must contain the information in paragraphs (b)(8)(i) through (iii) of this section. This includes periods of startup, shutdown, and malfunction.

(i) The total operating time of each affected source during the reporting period.

(ii) Information on the number, duration, and cause of the deviation (including unknown cause) as applicable and the corrective action taken.

(iii) A copy of the test report if the annual performance test showed a deviation from the Ni emissions limit or a deviation from the Hg emissions limit.

(9) For each deviation from an emission limitation (emissions limit or operating limit) in this subpart occurring at an affected source where you are using a CMS to comply with that emission limitation, you must include the information in paragraphs (b)(9)(i) through (xii) of this section. This includes periods of startup, shutdown, and malfunction and any deviations from your unit-specific monitoring plan as required in §63.10000(c).

(i) The date and time that each malfunction started and stopped and description of the nature of the deviation (i.e., what you deviated from).

(ii) The date and time that each CMS was inoperative, except for zero (low-level) and high-level checks.

(iii) The date, time, and duration that each CMS was out-of-control, including the information in §63.8(c)(8).

(iv) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period.

(v) A summary of the total duration of the deviation during the reporting period and the total duration as a percent of the total source operating time during that reporting period.

(vi) A breakdown of the total duration of the deviations during the reporting period into those that are due to startup, shutdown, control equipment problems, process problems, other known causes, and other unknown causes.

(vii) A summary of the total duration of CMS downtime during the reporting period and the total duration of CMS downtime as a percent of the total source operating time during that reporting period.

(viii) An identification of each parameter that was monitored at the affected source for which there was a deviation, including opacity, carbon monoxide, and operating parameters for wet scrubbers and other control devices.

(ix) A brief description of the source for which there was a deviation.

(x) A brief description of each CMS for which there was a deviation.

(xi) The date of the latest CMS certification or audit for the system for which there was a deviation.

(xii) A description of any changes in CMS, processes, or controls since the last reporting period for the source for which there was a deviation.

(10) A statement that each emissions averaging group was in compliance with its applicable limit during the semiannual reporting period.

(c) Immediate startup, shutdown, and malfunction report. If you had a startup, shutdown, or malfunction during the semiannual reporting period that was not consistent with your SSMP, you must submit an immediate startup, shutdown, and malfunction report according to the requirements of §63.10(d)(5)(ii).

(d) Part 70 monitoring report. Each affected source that has obtained a title V operating permit pursuant to 40 CFR part 70 or 40 CFR part 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a compliance report along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the compliance report includes all required information concerning deviations from any emission limitation (including any operating limit), submission of the compliance report satisfies any obligation to report the same deviations in the semiannual monitoring report. However, submission of a compliance report does not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permitting authority.

§63.10032 What records must I keep?

(a) You must keep records according to paragraphs (a)(1) through (3) of this section.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that you submitted, according to the requirements in §63.10(b)(2)(xiv).

(2) The records in §63.6(e)(3)(iii) through (v)

related to startup, shutdown, and malfunction.

(3) Records of performance tests or other compliance demonstrations and performance evaluations as required in §63.10(b)(2)(viii).

(b) For each monitoring system required by this subpart, you must keep records according to paragraphs (b)(1) through (4) of this section.

(1) Records described in §63.10(b)(2)(vi) through (xi).

(2) Previous (i.e., superseded) versions of the performance evaluation plan as required in §63.8(d)(3).

(3) Request for alternatives to relative accuracy test for CEMS as required in §63.8(f)(6)(i).

(4) Records of the date and time that each deviation started and stopped, and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period.

(c) You must keep the records required in Table 3 to this subpart including records of all monitoring data to show continuous compliance with each emission limitation that applies to you.

§63.10033 In what form and how long must I keep my records?

(a) Your records must be in a form suitable and readily available for expeditious review, according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record on site for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1). You can keep the records offsite for the remaining 3 years.

OTHER REQUIREMENTS AND INFORMATION

§63.10040 What parts of the General Provisions apply to me?

Table 4 to this subpart shows which parts of the General Provisions in §§63.1 through 63.15 apply to you.

§63.10041 Who implements and enforces this subpart?

(a) This subpart can be implemented and enforced by the U.S. Environmental Protection Agency (U.S. EPA), or a delegated authority such as your State, local, or tribal agency. If the Administrator has delegated authority to your State, local, or tribal agency, then that agency has the authority to implement and enforce this subpart. You should contact your EPA Regional Office to find out if this subpart is delegated to your State, local, or tribal agency.

(b) In delegating implementation and enforcement authority to this subpart to a State, local, or tribal agency under 40 CFR part 63, subpart E, the authorities contained in paragraph (c) of this section are retained by the Administrator and are not transferred to the State, local, or tribal agency. The U.S. EPA retains oversight of this subpart and can take enforcement actions, as appropriate.

(c) The authorities that will not be delegated to State, local, or tribal agencies are listed in paragraphs (c)(1) through (5) of this section.

(1) Approval of alternatives to the non-opacity emission limits in 63.9990(a) through (g) under §63.6(g).

(2) Approval of major alternatives to test methods under §63.7(e)(2)(ii) and (f) and as defined in §63.90.

(3) Approval of major alternatives to monitoring under §63.8(f) and as defined in §63.90.

(4) Approval of major alternatives to recordkeeping and reporting under §63.10(f) and as defined in §63.90.

(5) Approval of the unit-specific monitoring plan under §63.10000(c).

§63.10042 What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, in §63.2, and in this section as follows:

Anthracite coal means solid fossil fuel classified as anthracite coal by ASTM Designation D388-77, 90, 91, 95, or 98a (incorporated by reference--see 40 CFR 60.17).

Bituminous coal means solid fossil fuel classified as bituminous coal by ASTM D388-77, 90, 91, 95, or 98a (incorporated by reference--see 40 CFR 60.17).

Coal means all solid fossil fuels classified as anthracite, bituminous, subbituminous, or lignite by ASTM Designation D388-77, 90, 91, 95, or 98a (incorporated by reference--see 40 CFR 60.17).

Coal refuse means waste products of coal mining, physical coal cleaning, and coal preparation operations (e.g., culm, gob, etc.) containing coal, matrix material, clay, and other organic and inorganic material.

Coal-fired electric utility steam generating unit means an electric utility steam generating unit that burns coal, coal refuse, or a synthetic gas derived from coal either exclusively, in any combination together, or in any combination with other supplemental fuels. Examples of supplemental fuels include, but are not limited to, petroleum coke and tire-derived fuels.

Combined-cycle gas turbine means a stationary turbine combustion system where heat from the turbine exhaust gases is recovered by a waste heat boiler.

Deviation means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart including, but not limited to, any emission limitation (including any operating limit) or work practice standard;

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit; or

(3) Fails to meet any emission limitation (including any operating limit) or work practice standard in this subpart during startup, shutdown, or malfunction, regardless of whether or not such failure is permitted by this subpart.

Distillate oil means fuel oils that contain 0.05

weight percent nitrogen or less and comply with the specifications for fuel oil numbers 1 and 2, as defined by the American Society of Testing and Materials in ASTM D396-78, 89, 90, 92, 96, or 98, Standard Specifications for Fuel Oils (incorporated by reference--see 40 CFR 60.17).

Electric utility steam generating unit means any fossil fuel-fired combustion unit of more than 25 megawatts electric (MWe) that serves a generator that produces electricity for sale. A unit that cogenerates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 MWe output to any utility power distribution system for sale is also considered an electric utility steam generating unit.

Electrostatic precipitator means an add-on air pollution control device used to capture particulate matter by charging the particles using an electrostatic field, collecting the particles using a grounded collecting surface, and transporting the particles into a hopper.

Emission limitation means any emissions limit or operating limit.

Federally enforceable means all limitations and conditions that are enforceable by the Administrator, including the requirements of 40 CFR parts 60 and 61, requirements within any applicable State implementation plan, and any permit requirements established under 40 CFR 52.21 or §§51.18 and 51.24.

Fossil fuel means natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat.

Integrated gasification combined cycle (IGCC) electric utility steam generating unit means a coal-fired electric utility steam generating unit that burns a synthetic gas derived from coal in a combined-cycle gas turbine. No coal is directly burned in the unit during operation.

Lignite means solid fossil fuel classified as lignite coal by ASTM D388-77, 90, 91, 95, or 98a (incorporated by reference--see 40 CFR 60.17).

Oil means crude oil or petroleum or a liquid fuel derived from crude oil or petroleum, including distillate and residual oil.

Oil-fired electric utility steam generating unit means an electric utility steam generating unit that either burns oil exclusively, or burns oil alternately with burning fuels other than oil at other times.

<u>Residual oil</u> means crude oil, fuel oil numbers 1 and 2 that have a nitrogen content greater than 0.05 weight percent, and all fuel oil numbers 4, 5 and 6, as defined by the American Society of Testing and Materials in ASTM D396-78, Standard Specifications for Fuel Oils (incorporated by reference--see 40 CFR 60.17).

<u>Responsible official</u> means responsible official as defined in 40 CFR 70.2.

<u>Steam generating unit</u> means any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam (including fossil-fuel fired steam generators associated with combined-cycle gas turbines; nuclear steam generators are not included).

<u>Subbituminous coal</u> means solid fossil fuel that is classified as subbituminous A, B, or C according to the American Society of Testing and Materials (ASTM) Standard Specification for Classification of Coals by Rank D388-77 (incorporated by reference--see 40 CFR 60.17).

TABLES TO SUBPART UUUUU OF PART 63

Table 1 to Subpart UUUUU of Part 63 - Performance Test Requirements for Ni or Hg

As stated in §63.10007, you must comply with the following requirements for performance tests:

For each affected source...	**You must...**	**Using this method .**	**According to the following requirements...**
1. Subject to Ni emissions limit.	a. Select sampling port locations and number of traverse points in each stack or duct.	Method 1 or 1A (40 CFR part 60, appendix A).	Sampling sites must be located at the outlet of the control device (or at the outlet of the emissions source if no control device is present) prior to any releases to the atmosphere.
	b. Determine the volumetric flow rate of the stack gas.	Method 2, 2A, 2C, 2D, 2F, or 2G (40 CFR part 60, appendix A).	
	c. Determine the dry molecular weight of the stack gas.	Method 3A or 3B (40 CFR part 60, appendix A).	
	d. Determine the moisture content of the stack gas.	Method 4 (40 CFR part 60, appendix A).	

	e. Determine the Ni concentration.	Method 29 (40 CFR part 60, appendix A) for Ni.	
2. Subject to Ni emissions limit and that use an ESP.	Establish operating limits for minimum voltage and secondary current or total power input.	Data from the current and voltage monitors for the ESP and the Ni performance test.	(1) Collect secondary current and voltage or total power input for the ESP every 15 minutes during the entire period of the three-run Ni performance test.
			(2) Determine the average secondary current and voltage or total power input by computing the average of all 15 minute readings taken during each test run. You must set the minimum operating limits equal to the minimum 1-hour average values measured during the three-run performance test.

Table 2 to Subpart UUUUU of Part 63 – Initial Compliance with Emissions Limitations for Ni and Hg

As stated in §63.10009, you must show initial compliance with the emissions limitations according to the following:

For...	That is controlled with...	You have demonstrated initial compliance if...
1. Each oil-fired unit subject to a Ni emissions limit in §63.9991.	Electrostatic precipitator (ESP).	i. The average Ni emissions in lb/TBtu or lb/MWH over the three-run performance test do not exceed the applicable emissions limit.
		ii. You have a record of the average secondary current and voltage or total power input of the ESP for each test run over the three-run performance test during which the Ni emissions did not exceed the applicable limit.
2. Each oil-fired unit subject to alternative standard in §63.9991(b) for fuel switching.	Any type.	i. You submit a signed certification in the Notification of Compliance Status report that you burn only distillate oil as the fuel in your unit.

		ii. You have records demonstrating that you burn only distillate oil as the fuel in your unit.
3. Each coal-fired unit subject to Hg emissions limit in §63.9990.	Any.	You have established a site specific Hg limit according to the procedures in §63.10009 and reported the limit in your Notification of Compliance Status.

Table 3 to Subpart UUUUU of Part 63 — Continuous Compliance with Hg and Ni Emissions Limits

As stated in §63.10021, you must show continuous compliance with the emissions limitations according to the following:

For . . .	That is controlled with . . .	You must demonstrate continuous compliance by. . .
1. Each unit subject to Hg emissions limit in §63.9990.	Any type.	i. Continuously monitoring the hourly average Hg emissions using a CEMS or monitoring and recording the Hg measurements by semicontinous method.
		ii. Collecting and reducing the monitoring data according to §63.10020.
		iii. Calculating for each month the monthly rolling average emissions.
		iv. Maintaining the 12-month rolling average at or below the applicable limit.
2. Each unit subject to Ni limit in §63.9991.	Electrostatic precipitator.	i. Collecting and reducing the secondary current and voltage (or total power input) monitoring data.

		ii. Maintaining the hourly average secondary current and voltage or total power input at or above the limits established in the performance test. iii. Conducting performance tests at least once per year and reporting the results in the semiannual compliance report.
3. Each unit subject to alternative standard for distillate fuel switching in §63.9991(b).	Any type.	i. Submitting written certifications with each semiannual compliance report according to the requirements in §63.10031(b) and keeping records of fuel burned to document compliance. ii. Notifying the Administrator if resume burning fuel other than distillate oil according to the requirements in §63.10030(a). iii. If at any time the unit does not meet the alternative limit, the owner or operator must immediately comply with the applicable Ni limit, including all initial and continuous compliance requirements.

Table 4 to Subpart UUUUU of Part 63 – Applicability of General Provisions to Subpart UUUUU

As stated in §63.10040, you must comply with the applicable General Provisions according to the following:

Citation	Subject	Brief Description	Comments
§63.1	Applicability	Initial Applicability Determination; Applicability After Standard Established; Permit Requirements; Extensions, Notifications	Yes.
§63.2	Definitions	Definitions for part 63 standards	Yes.
§63.3	Units and Abbreviations	Units and abbreviations for part 63 standards	Yes.
§63.4	Prohibited Activities	Prohibited Activities; Compliance date; Circumvention, Severability	Yes.
§63.5	Construction/ Reconstruction	Applicability; applications; approvals	Yes.
§63.6(a)	Applicability	GP apply unless compliance extension AND GP apply to area sources that become major	Yes.

§63.6(b)(1)-(4)	Compliance Dates for New and Reconstructed sources	Standards apply at effective date; 3 years after effective date; upon startup; 10 years after construction or reconstruction commences for 112(f)	Yes.
§63.6(b)(5)	Notification	Must notify if commenced construction or reconstruction after proposal	Yes.
§63.6(b)(6)	[Reserved]		
§63.6(b)(7)	Compliance Dates for New and Reconstructed Area Sources That Become Major	Area sources that become major must comply with major source standards immediately upon becoming major, regardless of whether required to comply when they were an area source	Yes.
§63.6(c)(1)-(2)	Compliance Dates for Existing Sources	Comply according to date in subpart, which must be no later than 3 years after effective date AND For 112(f) standards, comply within 90 days of effective date unless compliance extension	Yes.

§63.6(c)(3)-(4)	[Reserved]		
§63.6(c)(5)	Compliance Dates for Existing Area Sources That Become Major	Area sources that become major must comply with major source standards by date indicated in subpart or by equivalent time period (for example, 3 years)	Yes.
§63.6(d)	[Reserved]		
§63.6(e)(1)-(2)	Operation & Maintenance	Operate to minimize emissions at all times AND Correct malfunctions as soon as practicable AND Operation and maintenance requirements independently enforceable information Administrator will use to determine if operation and maintenance requirements were met	Yes.
§63.6(e)(3)	Startup, Shutdown, and Malfunction Plan (SSMP)	Requirement for SSM and startup, shutdown, malfunction plan Content of SSMP	Yes.

§63.6(f)(1)	Compliance Except During SSM	Comply with emission standards at all times except during SSM	Yes.
§63.6(f)(2)-(3)	Methods for Determining Compliance	Compliance based on performance test, operation and maintenance plans, records, inspection	Yes.
§63.6(g)(1)-(3)	Alternative Standard	Procedures for getting an alternative standard	Yes.
§63.6(h)(1)	Compliance with Opacity/VE Standards	Comply with opacity/VE emissions limitations at all times except during SSM	No.
§63.6(h)(2)(i)	Determining Compliance with Opacity/Visible Emission (VE) Standards	If standard does not state test method, use Method 9 for opacity and Method 22 for VE	No.
§63.6(h)(2)(ii)	[Reserved]		
§63.6(h)(2)(iii)	Using Previous Tests to Demonstrate Compliance with Opacity/VE Standards	Criteria for when previous opacity/VE testing can be used to show compliance with this rule	No.
§63.6(h)(3)	[Reserved]		

§63.6(h)(4)	Notification of Opacity/VE Observation Date	Notify Administrator of anticipated date of observation	No.
§63.6(h)(5)(i),(iii)-(v)	Conducting Opacity/VE Observations	Dates and Schedule for conducting opacity/VE observations	No.
§63.6(h)(5)(ii)	Opacity Test Duration and Averaging Times	Must have at least 3 hours of observation with thirty, 6-minute averages	No.
§63.6(h)(6)	Records of Conditions During Opacity/VE observations	Keep records available and allow Administrator to inspect	No.
§63.6(h)(7)(i)	Report continuous opacity monitoring system monitoring data from performance test	Submit continuous opacity monitoring system data with other performance test data	No.
§63.6(h)(7)(ii)	Using continuous opacity monitoring system instead of Method 9	Can submit continuous opacity monitoring system data instead of Method 9 results even if rule requires Method 9, but must notify Administrator before performance test	No.

§63.6(h)(7)(iii)	Averaging time for continuous opacity monitoring system during performance test	To determine compliance, must reduce continuous opacity monitoring system data to 6-minute averages	No.
§63.6(h)(7)(iv)	Continuous opacity monitoring system requirements	Demonstrate that continuous opacity monitoring system performance evaluations are conducted according to §§63.8(e), continuous opacity monitoring system are properly maintained and operated according to 63.8(c) and data quality as §63.8(d)	No.
§63.6(h)(7)(v)	Determining Compliance with Opacity/VE Standards	Continuous opacity monitoring system is probative but not conclusive evidence of compliance with opacity standard, even if Method 9 observation shows otherwise. Requirements for continuous opacity monitoring system to be probative evidence–proper maintenance, meeting PS 1, and data have not been altered	No.

§63.6(h)(8)	Determining Compliance with Opacity/VE Standards	Administrator will use all continuous opacity monitoring system, Method 9, and Method 22 results, as well as information about operation and maintenance to determine compliance	No.
§63.6(h)(9)	Adjusted Opacity Standard	Procedures for Administrator to adjust an opacity standard	No.
§63.6(i)(1)-(14)	Compliance Extension	Procedures and criteria for Administrator to grant compliance extension	Yes.
§63.6(j)	Presidential Compliance Exemption	President may exempt source category from requirement to comply with rule	Yes.
§63.7(a)(1)	Performance Test Dates	Dates for Conducting Initial Performance Testing and Other Compliance Demonstrations	Yes.
§63.7(a)(2)(i)	Performance Test Dates	New source with initial startup date before effective date has 180 days after effective date to demonstrate compliance	Yes.

§63.7(a)(2)(ii)	Performance Test Dates	New source with initial startup date after effective date has 180 days after initial startup date to demonstrate compliance	Yes.
§63.7(a)(2)(iii)	Performance Test Dates	Existing source subject to standard established pursuant to 112(d) has 180 days after compliance date to demonstrate compliance AND Existing source with startup date after effective date has 180 days after startup to demonstrate compliance	Yes. Yes.
§63.7(a)(2)(iv)	Performance Test Dates	Existing source subject to standard established pursuant to 112(f) has 180 days after compliance date to demonstrate compliance	No.

§63.7(a)(2)(v)	Performance Test Dates	Existing source that applied for extension of compliance has 180 days after termination date of extension to demonstrate compliance	Yes.
§63.7(a)(2)(vi)	Performance Test Dates	New source subject to standard established pursuant to 112(f) that commenced construction after proposal date of 112(d) standard but before proposal date of 112(f) standard, has 180 days after compliance date to demonstrate compliance	No.
§63.7(a)(2)(vii-viii)	[Reserved]		
§63.7(a)(2)(ix)	Performance Test Dates	New source that commenced construction between proposal and promulgation dates, when promulgated standard is more stringent than proposed standard, has 180 days after effective date or 180 days after startup of source, whichever is later, to demonstrate	Yes.

		compliance AND If source initially demonstrates compliance with less stringent proposed standard, it has 3 years and 180 days after the effective date of the standard or 180 days after startup of source, whichever is later, to demonstrate compliance with promulgated standard	
§63.7(a)(3)	Section 114 Authority	Administrator may require a performance test under Act Section 114 at any time	Yes.
§63.7(b)(1)	Notification of Performance Test	Must notify Administrator 60 days before the test	Yes.
§63.7(b)(2)	Notification of Rescheduling	If rescheduling a performance test is necessary, must notify Administrator 5 days before scheduled date of rescheduled date	Yes.

§63.7(c)	Quality Assurance/Test Plan	Requirement to submit unit specific test plan 60 days before the test or on date Administrator agrees with: Test plan approval procedures AND Performance audit requirements AND Internal and External QA procedures for testing	Yes.
§63.7(d)	Testing Facilities	Requirements for testing facilities	Yes.

§63.7(e)(1)	Conditions for Conducting Performance Tests	Performance tests must be conducted under representative conditions AND Cannot conduct performance tests during SSM. AND Not a deviation to exceed standard during SSM AND Upon request of Administrator, make available records necessary to determine conditions of performance tests	Yes. Yes. Yes. Yes.
§63.7(e)(2)	Conditions for Conducting Performance Tests	Must conduct according to rule and EPA test methods unless Administrator approves alternative	Yes.

§63.7(e)(3)	Test Run Duration	Must have three separate test runs AND Compliance is based on arithmetic mean of three runs AND Conditions when data from an additional test run can be used	Yes.
§63.7(f)	Alternative Test Method	Procedures by which Administrator can grant approval to use an alternative test method	Yes.
§63.7(g)	Performance Test Data Analysis	Must include raw data in performance test report AND Must submit performance test data 60 days after end of test with the Notification of Compliance Status AND Keep data for 5 years	Yes.

§63.7(h)	Waiver of Tests	Procedures for Administrator to waive performance test	Yes.
§63.8(a)(1)	Applicability of Monitoring Requirements	Subject to all monitoring requirements in standard	Yes.
§63.8(a)(2)	Performance Specifications	Performance Specifications in appendix B of part 60 apply	Yes.
§63.8(a)(3)	[Reserved]		
§63.8(a)(4)	Monitoring with Flares	Unless your rule says otherwise, the requirements for flares in §63.11 apply	No.
§63.8(b)(1)(i)-(ii)	Monitoring	Must conduct monitoring according to standard unless Administrator approves alternative	Yes.
§63.8(b)(1)(iii)	Monitoring	Flares not subject to this section unless otherwise specified in relevant standard	No.
§63.8(b)(2)-(3)	Multiple Effluents and Multiple Monitoring Systems	Specific requirements for installing monitoring systems AND Must install on each effluent before it is combined and	Yes.

		before it is released to the atmosphere unless Administrator approves otherwise AND If more than one monitoring system on an emission point, must report all monitoring system results, unless one monitoring system is a backup	
§63.8(c)(1)	Monitoring System Operation and Maintenance	Maintain monitoring system in a manner consistent with good air pollution control practices	Yes.
§63.8(c)(1)(i)	Routine and Predictable SSM	Follow the SSM plan for routine repairs. Keep parts for routine repairs readily available Reporting requirements for SSM when action is described in SSM plan	Yes.
§63.8(c)(1)(ii)	SSM not in SSMP	Reporting requirements for SSM when action is not described in SSM plan	Yes.

§63.8(c)(1)(iii)	Compliance with Operation and Maintenance Requirements	How Administrator determines if source complying with operation and maintenance requirements AND Review of source O&M procedures, records, Manufacturer’s instructions, recommendations, and inspection of monitoring system	Yes.
§63.8(c)(2)-(3)	Monitoring System Installation	Must install to get representative emission and parameter measurements AND Must verify operational status before or at performance test	Yes.
§63.8(c)(4)	Continuous Monitoring System (CMS) Requirements	Continuous monitoring systems must be operating except during breakdown, out-of-control, repair, maintenance, and high-level calibration drifts	Yes.

§63.8(c)(4)(i)	Continuous Monitoring System (CMS) Requirements	Continuous opacity monitoring system must have a minimum of one cycle of sampling and analysis for each successive 10-second period and one cycle of data recording for each successive 6-minute period	No.
§63.8(c)(4)(ii)	Continuous Monitoring System (CMS) Requirements	Continuous emissions monitoring system must have a minimum of one cycle of operation for each successive 15-minute period	Yes.
§63.8(c)(7)-(8)	Continuous monitoring systems Requirements	Out-of-control periods, including reporting	Yes.
§63.8(d)	Continuous monitoring systems Quality Control	Requirements for continuous monitoring systems quality control, including calibration, etc. AND Must keep quality control plan on record for the life of the affected source. Keep old versions for 5 years after revisions	Yes.

§63.8(e)	Continuous monitoring systems Performance Evaluation	Notification, performance evaluation test plan, reports	Yes.
§63.8(f)(1)-(5)	Alternative Monitoring Method	Procedures for Administrator to approve alternative monitoring	Yes.
§63.8(f)(6)	Alternative to Relative Accuracy Test	Procedures for Administrator to approve alternative relative accuracy tests for continuous emissions monitoring system	No.
§63.8(g)(1)-(4)	Data Reduction	Continuous emissions monitoring system 1-hour averages computed over at least 4 equally spaced data points.	Yes.
§63.8(g)(5)	Data Reduction	Data that cannot be used in computing averages for continuous emissions monitoring system and continuous opacity monitoring system	No.
§63.9(a)	Notification Requirements	Applicability and State Delegation	Yes.

§63.9(b)(1)-(5)	Initial Notifications	Submit notification 120 days after effective date AND Notification of intent to construct/ reconstruct AND Notification of commencement of construct/reconstruct; Notification of startup AND Contents of each	Yes.
§63.9(c)	Request for Compliance Extension	Can request if cannot comply by date or if installed BACT/LAER	Yes.
§63.9(d)	Notification of Special Compliance Requirements for New Source	For sources that commence construction between proposal and promulgation and want to comply 3 years after effective date	Yes.
§63.9(e)	Notification of Performance Test	Notify Administrator 60 days prior	Yes.
§63.9(f)	Notification of VE/Opacity Test	Notify Administrator 30 days prior	No.

§63.9(g)	Additional Notifications When Using Continuous Monitoring Systems	Notification of performance evaluation AND Notification that exceeded criterion for relative accuracy	Yes.
§63.9(h)(1)-(6)	Notification of Compliance Status	Contents AND Due 60 days after end of performance test or other compliance demonstration When to submit to Federal vs. State authority	Yes.
§63.9(i)	Adjustment of Submittal Deadlines	Procedures for Administrator to approve change in when notifications must be submitted	Yes.
§63.9(j)	Change in Previous Information	Must submit within 15 days after the change	Yes.

§63.10(a)	Recordkeeping /Reporting	Applies to all, unless compliance extension AND When to submit to Federal vs. State authority AND Procedures for owners of more than 1 source	Yes.
§63.10(b)(1)	Recordkeeping /Reporting	General Requirements AND Keep all records readily available AND Keep for 5 years	Yes.

§63.10(b)(2)(i)-(v)	Records related to Startup, Shutdown, and Malfunction	Occurrence of each of operation (process equipment) AND Occurrence of each malfunction of air pollution equipment AND Maintenance on air pollution control equipment AND Actions during startup, shutdown, and malfunction	Yes.
§63.10(b)(2)(vi) and (x-xi)	Continuous monitoring systems Records	Malfunctions, inoperative, out-of-control AND Calibration checks AND Adjustments, maintenance	Yes.

§63.10(b)(2)(vii)-(ix)	Records	Measurements to demonstrate compliance with emissions limitations AND Performance test and performance evaluation AND Measurements to determine conditions of performance tests and performance evaluations.	Yes.
§63.10(b)(2)(xii)	Records	Records when under waiver	Yes.
§63.10(b)(2)(xiii)	Records	Records when using alternative to relative accuracy test	Yes.
§63.10(b)(2)(xiv)	Records	All documentation supporting Initial Notification and Notification of Compliance Status	Yes.
§63.10(b)(3)	Records	Applicability Determinations	Yes.
§63.10(c)(1)-(6),(9)-(15)	Records	Additional Records for continuous monitoring systems	Yes.

§63.10(c)(7)-(8)	Records	Records of excess emissions and parameter monitoring exceedances for continuous monitoring systems	Yes.
§63.10(d)(1)	General Reporting Requirements	Requirement to report	Yes.
§63.10(d)(2)	Report of Performance Test Results	When to submit to Federal or State authority	Yes.
§63.10(d)(3)	Reporting Opacity or VE Observations	What to report and when	No.
§63.10(d)(4)	Progress Reports	Must submit progress reports on schedule if under compliance extension	Yes.
§63.10(d)(5)	Startup, Shutdown, and Malfunction Reports	Contents and submission	Yes.
§63.10(e)(1)-(2)	Additional continuous monitoring systems Reports	Must report results for each CEM on a unit AND Written copy of performance evaluation	Yes.
§63.10(e)(3)	Reports	Excess Emission Reports	No.

§63.10(e)(3)(i-iii)	Reports	Schedule for reporting excess emissions and parameter monitor exceedance (now defined as deviations)	No.
§63.10(e)(3)(iv-v)	Excess Emissions Reports	Requirement to revert to quarterly submission if there is an excess emissions and parameter monitor exceedance (now defined as deviations) AND Provision to request semiannual reporting after compliance for one year AND Submit report by 30th day following end of quarter or calendar half AND If there has not been an exceedance or excess emission (now defined as deviations), report contents is a statement that there have been no deviations	No.

§63.10(e)(3) (iv-v)	Excess Emissions Reports	Must submit report containing all of the information in §63.10(c)(5-13), §63.8(c)(7-8)	No.
§63.10(e)(3) (vi-viii)	Excess Emissions Report and Summary Report	Requirements for reporting excess emissions for continuous monitoring systems (now called deviations) Requires all of the information in §63.10(c)(5-13), §63.8(c)(7-8)	No.
§63.10(e)(4)	Reporting continuous opacity monitoring system data	Must submit continuous opacity monitoring system data with performance test data	No.
§63.10(f)	Waiver for Recordkeeping /Reporting	Procedures for Administrator to waive	Yes.
§63.11	Flares	Requirements for flares	No.
§63.12	Delegation	State authority to enforce standards	Yes.
§63.13	Addresses	Addresses where reports, notifications, and requests are sent	Yes.
§63.14	Incorporation by Reference	Test methods incorporated by reference	Yes.
§63.15	Availability of Information	Public and confidential information	Yes.

7. Appendix B to part 63 is amended by adding in numerical order new Method 324 to read as follows:

METHOD 324 – DETERMINATION OF VAPOR PHASE FLUE GAS MERCURY EMISSIONS FROM STATIONARY SOURCES USING DRY SORBENT TRAP SAMPLING

1.0 Introduction.

This method describes sampling criteria and procedures for the continuous sampling of mercury (Hg) emissions in combustion flue gas streams using sorbent traps. Analysis of each trap can be by cold vapor atomic fluorescence spectrometry (AF) which is described in this method, or by cold vapor atomic absorption spectrometry (AA). Only the AF analytical method is detailed in this method, with reference being made to other published methods for the AA analytical procedure. The Electric Power Research Institute has investigated the AF analytical procedure in the field with the support of ADA-ES and Frontier Geosciences, Inc. The AF procedure is based on EPA Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry. Persons using this method should have a thorough working knowledge of Methods 1, 2, 3, 4 and 5 of 40 CFR part 60, appendix A.

1.1 Scope and Application.

1.1.1 Analytes. The analyte measured by this method is total vapor-phase Hg, which represents the sum of elemental (CAS Number 7439-97-6) and oxidized forms of Hg, mass concentration (micrograms/dscm) in flue gas samples.

1.1.2 Applicability. This method is applicable to the determination of vapor-phase Hg concentrations ranging from 0.03 μg/dncm to 100 μg/dncm in low-dust applications, including controlled and uncontrolled emissions from stationary sources, only when specified within the regulations. When employed to demonstrate compliance with an emission regulation, paired sampling is to be performed as part of the method quality control procedure. The method is appropriate for flue gas Hg measurements from combustion sources. Very low Hg concentrations will require greater sample volumes. The method can be used over any period from 30 minutes to several days in duration, provided appropriate sample volumes are collected and all the quality control criteria in Section 9.0 are met. When sampling for periods greater than 12 hours, the sample rate is required to be maintained at a constant proportion to the total stack flowrate, ±25 percent to ensure representativeness of the sample collected.

2.0 Summary of Method.

Known volumes of flue gas are extracted from a duct through a single or paired sorbent traps with a nominal flow rate of 0.2 to 0.6 liters per minute through each trap. Each trap is then acid leached and the resulting leachate is analyzed by cold vapor atomic fluorescence spectrometry (CVAFS) detection. The AF analytical procedure is described in detail in EPA Method 1631. Analysis by AA can be performed by existing recognized procedures, such as that contained in ASTM Method D6784-02 (incorporated by reference, see §63.14) or EPA Method 29.

3.0 Definitions. [Reserved]

4.0 Clean Handling and Contamination.

During preparation of the sorbent traps, as well as transport, field handling, sampling, recovery, and laboratory analysis, special attention must be paid to cleanliness procedures. This is to avoid Hg contamination of the samples, which generally contain very small amounts of Hg. For specifics on how to avoid contamination, Section 4 of Method 1631 should be well understood.

5.0 Safety.

5.1 Site hazards must be prepared for in advance of applying this method in the field. Suitable clothing to protect against site hazards is required, and requires advance coordination with the site to understand the conditions and applicable safety policies. At a minimum, portions of the sampling system will be hot, requiring appropriate gloves, long sleeves, and caution in handling this equipment.

5.2 Laboratory safety policies are to minimize risk of chemical exposure and to properly handle waste disposal. Personnel will don appropriate laboratory attire according to a Chemical Hygiene Plan established by the laboratory. This includes, but is not limited to, laboratory coat, safety goggles, and nitrile gloves under clean gloves.

5.3 The toxicity or carcinogenicity of reagents used in this method has not been fully established. The procedures required in this method may involve hazardous materials, operations, and equipment. This method may not address all of the safety problems associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures. Each chemical should be regarded as a potential health hazard and exposure to these compounds should be minimized. Chemists should refer to the MSDS for each chemical with which they are working.

5.4 Any wastes generated by this procedure must be disposed of according to a hazardous materials management plan that details and tracks various waste streams and disposal procedures.

6.0 Equipment and Supplies.

6.1 Hg Sampling Train. A Schematic of a single trap sampling train used for this method is shown in Figure 324-1. Where this method is used to collect data to demonstrate compliance with a regulation, it must be performed with paired sorbent trap equipment.

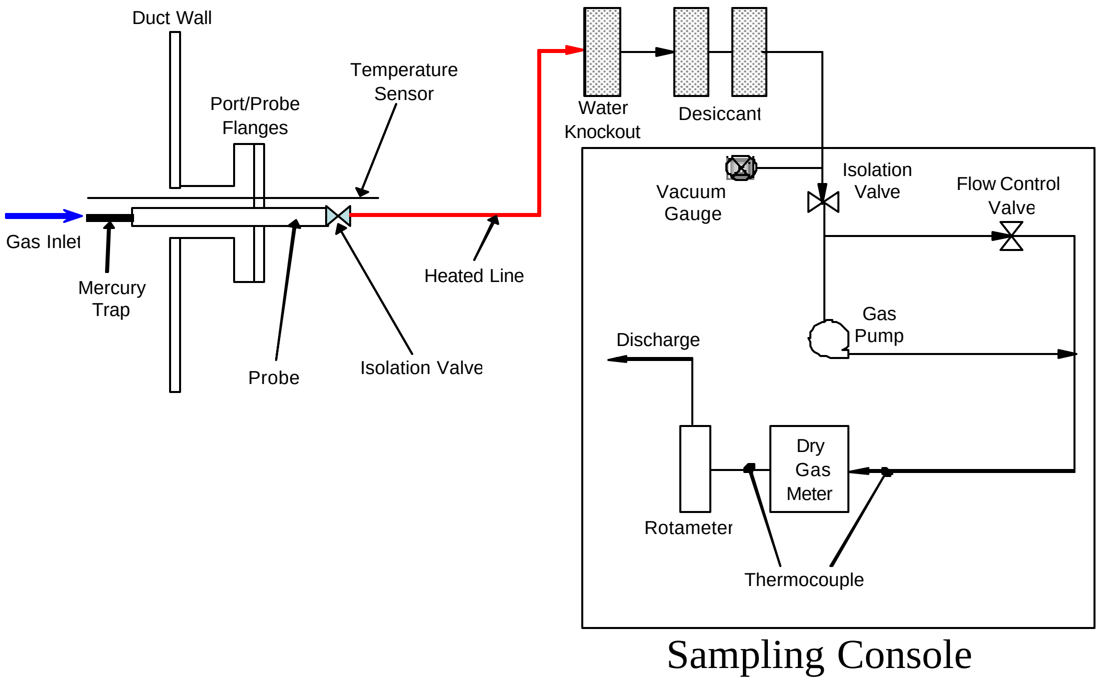

Figure 324-1. Hg Sampling Train illustrating Single Trap.

6.1.1 Sorbent Trap. Use sorbent traps with separate main and backup sections in series for collection of Hg. Selection of the sorbent trap shall be based on: 1) achievement of the performance criteria of this method, and 2) data is available to demonstrate the method can pass the criteria in EPA Method 301 when used in this method and when the results are compared with those from EPA Method 29, EPA Method 101A, or ASTM Method 6784-02 for the measurement of vapor-phase Hg in a similar flue gas matrix. Appropriate traps are referred to as “sorbent trap” throughout this method. The method requires the analysis of Hg in both main and backup portions of the sorbent within each trap. The sorbent trap should be obtained from a reliable source that has clean handling procedures in place for ultra low-level Hg analysis. This will help assure the low Hg environment required to manufacture sorbent traps with low blank levels of Hg. Sorbent trap sampling requirements or needed characteristics are shown in Table 324-1. Blank/cleanliness and other requirements are described in Table 324-2. The sorbent trap is supported on a probe and inserted directly into the flue gas stream, as shown on Figure 324-1. The sampled sorbent trap is the entire Hg sample.

6.1.2 Sampling Probe. The probe assembly shall have a leak-free attachment to the sorbent trap. For duct temperatures from 200 to 375°F, no heating is required. For duct temperatures less than 200°F, the sorbent tube must be heated to at least 200°F or higher to avoid liquid condensation in the sorbent trap by using a heated probe. For duct temperatures greater than 375°F, a large sorbent trap must be used, as shown in Table 324-1, and no heating is required. A thermocouple is used to monitor stack temperature.

6.1.3 Umbilical Vacuum Line. A 250°F heated umbilical line shall be used to convey to the moisture knockout the sampled gas that has passed through the sorbent trap and probe assembly.

6.1.4 Moisture Knockout. Impingers and desiccant can be combined to dry the sample gas prior to entering the dry gas meter. Alternative sample drying methods are acceptable as long as they do not affect sample volume measurement.

6.1.5 Vacuum Pump. A leak tight vacuum pump capable of delivering a controlled extraction flow rate between 0.1 to 0.8 liters per minute.

6.1.6 Dry Gas Meter. Use a dry gas meter that is calibrated according to the procedures in 40 CFR part 60, appendix A, Method 5, to measure the total sample volume collected. The dry gas meter must be sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate and conditions actually encountered during sampling, and equipped with a temperature sensor capable of measuring typical meter temperatures accurately to within 3°C (5.4°F).

6.2 Sample Analysis Equipment. Laboratory equipment as described in Method 1631, Sections 6.3 to 6.7 is required for analysis by AF. For analysis by AA, refer to Method 29 or ASTM Method 6784-02.

Table 324-1. Sorbent Trap and Sampling Requirements.

Item to be determined	Small Sorbent Trap	Large Sorbent Trap
Sampling Target: Hg Loading Range, ug	Minimum = 0.025 µg/trap Maximum = 150 µg/trap	Minimum = 0.10 µg/trap Maximum = 1800 µg/trap
Sampling Duration Required: limits on sample times	Minimum = 30 minutes Maximum = 24 hours	Minimum = 24 hours Maximum = 10 days
Sampling Temperature Required	200 to 375˚F	200 to 425˚F
Sampling Rate Required	0.2 to 0.6 L/min; start at 0.4 L/min Must be constant proportion within +/-25% if greater than 12 hours; constant rate within +/-25% if less than 12 hours.	0.2 to 0.6 L/min; start at 0.4 L/min Must be constant proportion of stack flowrate within +/-25%

7.0 <u>Analysis by AF, Reagents and Standards</u>.

For analysis by AF, use Method 1631, Sections 7.1 – 7.3 and 7.5 – 7.12 for laboratory reagents and standards. Refer to Method 29 or ASTM Method 6784-02 for analysis by AA.

7.1 Reagent Water. Same as Method 1631, Section 7.1.

7.2 Air. Same as Method 1631, Section 7.2.

7.3 Hydrochloric Acid. Same as Method 1631, Section 7.3.

7.4 Stannous Chloride. Same as Method 1631, Section 7.5.

7.5 Bromine Monochloride (BrCl, 0.01N). Same as Method 1631, Section 7.6.

7.6 Hg Standards. Same as Method 1631, Sections 7.7 to 7.11.

7.7 Nitric Acid. Reagent grade, low Hg.

7.8 Sulfuric Acid. Reagent grade, low Hg.

7.9 Nitrogen. Same as Method 1631, Section 7.12.

7.10 Argon. Same as Method 1631, Section 7.13.

8.0 Sample Collection and Transport.

8.1 Pre-Test.

8.1.1 Site information should be obtained in accordance with Method 1 (40 CFR part 60, appendix A). Identify a location that has been shown to be free of stratification for SO_2 and NO_x through concentration measurement traverses for those gases. An estimation of the expected Hg concentration is required to establish minimum sample volumes. Based on estimated minimum sample volume and normal sample rates for each size trap used, determine sampling duration with the data provided in Table 324-1.

8.1.2 Sorbent traps must be obtained from a reliable source such that high quality control and trace cleanliness are maintained. Method detection limits will be adversely affected if adequate cleanliness is not maintained. Sorbent traps should be handled only with powder-free low Hg gloves (vinyl, latex, or nitrile are acceptable) that have not touched any other surface. The sorbent traps should not be removed from their clean storage containers until after the preliminary leak check has been completed. Field efforts at clean handling of the sorbent traps are key to the success of this method.

8.1.3 Assemble the sample train according to Figure 324-1, except omit the sorbent trap.

8.1.4 Preliminary Leak Check. Perform system leak check without the single or dual sorbent traps in place. This entails plugging the end of the probe to which each sorbent trap will be affixed, and using the vacuum pump to draw a vacuum in each sample train. Adjust the vacuum in the sample train to 15 inches Hg. A rotameter on the dry gas meter will indicate the leakage rate. The leakage rate must be less than 2 percent of the planned sampling rate.

8.1.5 Release the vacuum in the sample train, turn off the pump, and affix the sorbent trap to the end of the probe, using clean handling procedures. Leave the flue gas end of the sorbent trap plugged.

8.1.6 Pre-test leak check. Perform a leak check with the Sorbent trap in place. Use the sampling vacuum pump to draw a vacuum in the sample train. Adjust the vacuum in the sample train to 15 inches Hg. A rotameter on the dry gas meter will indicate the leakage rate. Record the leakage rate. The leakage rate must be less than 2 percent of the planned sampling rate. Once the leak check passes this criterion, carefully release the vacuum in the sample train (the sorbent trap must not be exposed to abrupt changes in pressure or to backflow), then re-cap the flue gas end of the sorbent trap until the probe is ready for insertion. The sorbent trap packing beds must be undisturbed by the leak test to prevent gas channeling through the media during sampling.

8.1.7 Use temperature controllers to heat the portions of the trains that require it. The sorbent trap must be maintained between 200 and 375 °F during sampling.

8.1.8 Gas temperature and static pressure must be considered prior to sampling in order to maintain proper safety precautions during sampling.

8.2 Sample Collection.

8.2.1 Remove the plug from the end of a sorbent trap and store it in a clean sorbent trap storage container. Remove the sample duct port cap and insert the probe. Secure the probe and ensure that no leakage occurs between the duct and environment.

8.2.2 Record initial data including the start time, starting dry gas meter readings, and the name of the field tester(s). Set the initial sample flow rate to 0.4 L/min (+/- 25 percent).

8.2.3 For constant-flow sampling (samples less than 12 hours in duration), every 10-15 minutes during the sampling period: record the time, the sample flow rate, the gas meter readings, the duct temperature, the flow meter temperatures, temperatures of heated equipment such as the vacuum lines and the probes (if heated), and the sampling vacuum reading. Adjust the sample rate as needed, maintaining constant sampling within +/- 25 percent of the initial reading.

8.2.4 For constant proportion sampling (samples 12 hours or greater in duration), every hour during the sampling period: record the time, the sample flow rate, the gas meter readings, the duct temperature, the flow meter temperatures, temperatures of heated equipment such as the vacuum lines and the probes (if heated), and the sampling vacuum readings. Also record the stack flow rate reading, whether provided as a CEM flow monitor signal, a pitot probe or other direct flow indication, or a plant input signal. Adjust the sampling rate to maintain proportional sampling within +/- 25 percent relative to the total stack flowrate.

8.2.5 Obtain and record operating data for the facility during the test period, including total stack flowrate and the oxygen concentration at the flue gas test location. Barometric pressure must be obtained for correcting sample volume to standard conditions.

8.2.6 Post Test Leak Check. When sampling is completed, turn off the sample pump, remove the probe from the port and carefully re-plug the end of the sorbent trap. Perform leak check by turning on the sampling vacuum pumps with the plug in place. The rotameter on the dry gas meters will indicate the leakage rates. Record the leakage rate and vacuum. The leakage rate must be less than 2 percent of the actual sampling rate. Following the leak check, carefully release the vacuum in the sample train.

8.2.7 Sample Recovery. Recover each sampled sorbent trap by removing it from the probe, plugging both ends with the clean caps provided with the sorbent trap, and then wiping any dirt off the outside of the sorbent trap. Place the sorbent trap into the clean sample storage container in which it was provided, along with the data sheet that includes the post-test leak check, final volume, and test end time.

8.3 Quality Control Samples and Requirements.

8.3.1 Field blanks. Refer to Table 324-2.

8.3.2 Duplicate (paired or side by side) samples. Refer to Section 8.6.6 of Performance Specification 12A of 40 CFR part 60, appendix B for this criteria.

8.3.3 Breakthrough performance data (“B” bed in each trap, or second traps behind). Refer to Table 324-2.

8.3.4 Field spikes (sorbent traps spiked with Hg in the lab and periodically sampled in the field to determine overall accuracy). Refer to Table 324-2.

8.3.5 Laboratory matrix and matrix spike duplicates. Refer to Table 324-2.

9.0 Quality Control.

Table 324-2 summarizes the major quantifiable QC components.

Table 324-2. Quality Control for Samples

QA/QC Specification	Acceptance Criteria	Frequency	Corrective Action
Leak-check	<2% of sampling rate	Pre and post-sampling	Pre-sampling: repair leak. Post-sampling: Flag data and repeat run if for regulatory compliance.
Sample Flow Rate for samples less than 12 hours in duration	0.4 L/min initially and +/-25% of initial rate throughout run	Throughout run every 10-15 minutes	Adjust when data is recorded.
Sample Flow Rate for samples greater than 12 hours in duration	0.4 L/min initially and maintain +/-25% of ratio to flue gas flow rate throughout sampling	Throughout run every hour	Adjust when data is recorded
Sorbent trap laboratory blank (same lot as samples)	<5 ng/trap and a standard deviation of <1.0 ng/trap (n=3)	3 per analysis set of 20 sorbent traps	
Sorbent trap field blank (same lot as samples)	<5 ng/trap and a standard deviation of <1.0 ng/trap (n=3) OR <5% of average sample collected	1 per every 10 field samples collected	
B-Trap Bed Analysis	<2% of A-Trap Bed Value OR < 5 ng/trap	Every sample	
Paired Train Results	Same as Section 8.6.6 of PS-12A of 40CFR Par60, Appendix B		
Field Spikes	80 % to 120% recovery	For long-term regulatory monitoring, 1 per every 3 samples for the first 12 samples	If the first 4 field spikes do not meet the +/-20% criteria, take corrective sampling and

			laboratory measures and repeat at the 1 per every 3 sample rate until the +/-20% criteria is met.
Laboratory matrix and matrix spike duplicates	85% to 115% recovery	1 per every 10 or 20 samples-to be determined	

10.0 Calibration and Standards.

Same as Sections 10.1, 10.2 and 10.4 of Method 1631.

10.1 Calibration and Standardization. Same as Sections 10.1 and 10.4 of Method 1631.

10.2 Bubbler System. Same as Section 10.2 of M1631.

10.3 Flow-Injection System. Not applicable.

11.0 Analytical Procedures.

11.1 Preparation Step. The sorbent traps are received and processed in a low-Hg environment (class-100 laminar-flow hood and gaseous Hg air concentrations below 20 ng/m^3) following clean-handling procedures. Any dirt or particulate present on the exterior of the trap must be removed to avoid contamination of the sample. The sorbent traps are then opened and the sorbent bed(s) transferred to an appropriate sized trace-clean vessel.

It is recommended that the height of the trace-clean vessel be at least 3 times the diameter to facilitate a refluxing action.

11.2 Leaching Step. The sorbent trap is then subjected to a hot-acid leach using a 70:30 ratio mixture of concentrated HNO_3/H_2SO_4. The acid volume must be 40 percent of the expected end volume of the digest after dilution. The HNO_3/H_2SO_4 acid to carbon ratio should be approximately 35:1. The leachate is then heated to a temperature of 50 to 60°C for 1.5 to 2.0 hours in the finger-tight capped vessels. This process may generate significant quantities of noxious and corrosive gasses and must only be performed in a well-ventilated fume hood. Care must be taken to prevent excessive heated leaching of the samples as this will begin to break down the charcoal material.

11.3 Dilution Step. After the leached samples have been removed from the hot plate and allowed to cool to room temperature, they are brought to volume with a 5 percent (v/v) solution of 0.01 N BrCl. As the leaching digest contains a substantial amount of dissolved gasses, add the BrCl slowly, especially if the samples are still warm. As before, this procedure must be performed in a properly functioning fume hood. The sample is now ready for analysis.

11.4 Hg Reduction and Purging. (Reference Section 11.2 of M1631 except that NH_2OH is not used.)

11.4.1 Bubbler System. Pipette an aliquot of the digested sample into the bubbler containing pre-blanked reagent water and a soda lime trap connected to the exhaust port. Add stannous chloride ($SnCl_2$) to reduce the aliquot and then seal the bubbler. Connect gold sample traps to the end of the soda lime trap as shown in Figures 1 and 2 of Method 1631. Finally, connect the N_2 lines and purge for 20 minutes. The sample trap can then be added into the analytical train. M1631, Section 11.2.1.

11.4.2 Flow Injection System. If required.

11.5 Desorption of Hg from the gold trap, and peak evaluation. Use Section 11.3 and 11.4 in M1631.

11.6 Instrument Calibration. Analyze the standards by AA or AF following the guidelines specified by the instrument manufacturer. Construct a calibration curve by plotting the absorbances of the standards versus µg/l Hg. The R^2 for the calibration curve should be 0.999 or better. If the curve does not have an R^2 value equal to or better than 0.999 then the curve should be rerun. If the curve still does not meet this criteria then new standards should be prepared and the instrument recalibrated. All calibration points contained in the curve must be within 10 percent of the calibration value when the calibration curve is applied to the calibration standards.

11.7 Sample Analysis. Analyze the samples in duplicate following the same procedures used for instrument calibration. From the calibration curve, determine sample Hg concentrations. To determine total Hg mass in each sample fraction, refer to calculations in Section 15. Record all sample dilutions

11.8 Continued Calibration Performance. To verify continued calibration performance, a continuing calibration check standard should be run every 10 samples. The measured Hg concentration of the continuing calibration check standard must be within 10 percent of the expected value.

11.9 Measurement Precision. The QA/QC for the analytical portion of this method is that every sample, after it has been prepared, is to be analyzed in duplicate with every tenth sample analyzed in triplicate.

These results must be within 10 percent of each other. If this is not the case, then the instrument must be recalibrated and the samples reanalyzed.

11.10 Measurement Accuracy. Following calibration, an independently prepared standard (not from same calibration stock solution) should be analyzed. In addition, after every ten samples, a known spike sample (standard addition) must be analyzed. The measured Hg content of the spiked samples must be within 10 percent of the expected value.

11.11 Independent QA/QC Checks. It is suggested that the QA/QC procedures developed for a test program include submitting, on occasion, spiked Hg samples to the analytical laboratory by either the prime contractor, if different from the laboratory, or an independent organization. The measured Hg content of reference samples must be within 15 percent of the expected value. If this limit is exceeded, corrective action (e.g., re-calibration) must be taken and the samples re-analyzed.

11.12 Quality Assurance/Quality Control. For this method, it is important that both the sampling team and analytical people be very well trained in the procedures. This is a complicated method that requires a high-level of sampling and analytical experience. For the sampling portion of the QA/QC procedure, both solution and field blanks are required. It should be noted that if high-quality reagents are used and care is taken in their preparation and in the train assembly, there should be little, if any, Hg measured in either the solution or field blanks.

11.13 Solution Blanks. Solution blanks must be taken and analyzed every time a new batch of solution is prepared. If Hg is detected in these solution blanks, the concentration is subtracted from the measured sample results. The maximum amount that can be subtracted is 10 percent of the measured result or 10 times the detection limit of the instrument which ever is lower. If the solution blanks are greater than 10 percent the data must be flagged as suspect.

11.14 Field Blanks. A field blank is performed by assembling a sample train, transporting it to the sampling location during the sampling period, and recovering it as a regular sample. These data are used to ensure that there is no contamination as a result of the sampling activities. A minimum of one field blank at each sampling location must be completed for each test site. Any Hg detected in the field blanks cannot be subtracted from the results. Whether or not the Hg detected in the field blanks is significant is determined based on the QA/QC procedures established prior to the testing. At a minimum, if field blanks exceed 30 percent of the measured value at the corresponding location, the data must be flagged as suspect.

12.0 Calculations and Data Analysis.

Use Section 12 in M1631.

13.0 Constant Proportion Sampling.

Calculate the Sample Rate/Stack Flow = “x”. “X” must be maintained within 0.75 “x” to 1.25 “x” for sampling times in excess of 12 hours. For mass emission rate calculations, use the flow CEM total measured flow corresponding to the sorbent trap sample time period.

14.0 Sampling and Data Summary Calculations.

Refer to 40 CFR part 60, appendix A, Methods 2, 4, and 5 for example calculations.

15.0 Pollution Prevention.

Refer to Section 13 in Method 1631.

16.0 Waste Management.

Refer to Section 14 in Method 1631.

17.0 Bibliography.

17.1 EPA Method 1631, Revision E “Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry,” August 2002.

17.2 “Comparison of Sampling Methods to Determine Total and Speciated Mercury in Flue Gas,” CRADA F00-038 Final Report, DOE/NETL-2001/1147, January 4, 2001.

17.3 40 CFR part 60, appendix A, “Method 29 - Determination of Metals Emissions from Stationary Sources”.

17.4 40 CFR part 60, appendix B, “Performance Specification 12A, Specification and Test Procedures for Total Vapor Phase Mercury Continuous Emission Monitoring Systems in Stationary Sources”.

17.5 ASTM Method 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)”.

Option 2

For the reasons set out in the preamble, title 40, chapter 1, parts 51, 52, 60, and 63 of the Code of Federal Regulations are amended as follows:

PART 51-–[AMENDED]

1. The authority citation for part 51 continues to

read as follows:

Authority: 42 U.S.C. 7401, et seq.

2. Section 51.166(b)(23)(i) is amended by adding . . . to read as follows:

§51.166 Prevention of significant deterioration of air quality

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[To be inserted as necessary.]

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PART 52--[AMENDED]

3. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

4. Section 52.21(b)(23)(i) is amended by adding an entry to the end of the Pollutant and Emission Rate list to read as follows:

§52.21 **[Insert section title]**

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[Text to be added.]

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PART 60--[AMENDED]

5. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401, et seq.

6. Section 60.17 is amended by adding paragraph (a)(65) to read as follows:

§60.17 Incorporation by Reference.

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(a)(65) 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), for appendix B to part 60, Performance Specification 12A.

Subpart C--[AMENDED]

7. Section 60.30 is amended by adding new paragraph (f) to read as follows:

Subpart C–-Emission Guidelines and Compliance Times

§60.30 Scope.

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(f) Subpart Cf - Electric Utility Steam Generating Units.

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8. Subpart C is amended by adding new subpart Cf to read as follows:

Subpart Cf--Emission Guidelines and Compliance Times for Electric Utility Steam Generating Units

§60.30f Scope.

This subpart contains emission guidelines and compliance times for the control of certain designated pollutants from certain designated electric utility steam generating units in accordance with section 111(d) of the Act and subpart B of this part.

§60.31f Definitions.

Terms used but not defined in this subpart have the meaning given them in the Act and in subparts A, B, and Da of this part.

§60.32f Designated facilities.

(a) The designated facility to which the emission guidelines apply is each existing electric utility steam generating unit for which construction, reconstruction or modification was commenced before [INSERT DATE OF PUBLICATION OF PROPOSED AMENDMENTS IN THE FEDERAL REGISTER].

(b) Physical or operational changes made to an existing electric utility steam generating unit solely to comply with an emission guideline are not considered a modification or reconstruction and would not subject an existing electric utility steam generating unit to the requirements of subpart Da (see §60.40a of subpart Da).

§60.33f Emission guidelines for electric utility steam generating units.

(a) Emission guidelines for coal-fired electric utility steam generating units

[Insert Hg guidelines.]

(b) Emission guidelines for oil-fired electric utility steam generating units

For approval, a State plan shall include emission limits for nickel (Ni) at least as protective as the provisions specified in this paragraph paragraphs (b)(1) through (b)(2) of this section.

(1) The emission limit for Ni contained in the gases discharged to the atmosphere from a designated facility is 210 pounds of Ni per trillion Btu (lb/TBtu) in an input-based format and 0.002 pounds of Ni per megawatt hour (lb/MWh) in an output-based format. The SI equivalent is 0.25 ng/J.

(2) The emission limit for Ni for oil-fired electric utility steam generating units does not apply if the owner/operator permanently uses distillate oil as fuel. Except as provided in paragraph (5) of this section, the emissions limit for Ni for oil-fired electric utility steam generating units will immediately

apply if the owner/operator subsequently uses a fuel other than distillate oil.

(3) If you use an electrostatic precipitator (ESP) to meet a Ni emissions limit in this part, you must operate the ESP such that the hourly average voltage and secondary current (or total power input) do not fall below the limit established in the initial or subsequent performance test.

(4) If you use a control device or combination of control devices other than an ESP to meet the Ni emissions limit, or you wish to establish and monitor an alternative operating limit and alternative monitoring parameters for an ESP, you must apply to the Administrator for approval of alternative monitoring under §60.13(i).

(5) If you comply with the requirements in §60.33f(b)(2) for switching fuel, and you must switch fuel because of an emergency, you must notify the Administrator in writing within 30 days of using a fuel other than distillate oil.

§60.34f Compliance provisions and performance testing.

For approval, a State plan shall include the performance testing compliance demonstration requirements as listed in paragraphs (1) and (2) of this section.

(1) Affected facilities will conduct a performance test to demonstrate compliance with this section no later than 180 days after the initial startup or 180 days after publication of the final amendments, whichever is later and annually thereafter. The performance test is to be conducted using Method 29 of appendix A of this part to determine Ni emission concentration in the flue gas stream. The Ni emissions concentration for compliance under this part is determined by the three-run average (nominal 1-hour runs) using Method 29 of appendix A of this part for the initial and subsequent performance tests.

(2) The owner or operator shall demonstrate compliance with the Ni limit in §60.46a according to the procedures in this paragraph to convert the Method 29 Ni measurement from the performance test to the selected format for comparison to the applicable §60.46a Ni emission limits.

(a) Sum the Ni concentrations obtained from the Method 29 test runs, milligrams per dscm (mg/dscm).

(b) Calculate the total volumetric flow obtained during the Method 29 test runs, (dscm).

(c) Multiply the total Ni concentration times the total volumetric flow for the duration of the initial compliance testing period to obtain the total mass of Ni in milligrams.

(d) Calculate the input-based Ni emissions rate in a lb/TBtu format using Equation 1 of this section.

$$ER = \frac{M \times \text{conversion factor}}{TP_{\text{input-based}}} \qquad \text{(Eq. 1)}$$

Where:

ER = Ni emissions rate, (lb/TBtu);
M = Total mass of Ni emissions, (mg);
Conversion factor = 2.205×10^{-6}, used to convert milligrams to pounds; and
$TP_{\text{input-based}}$= Total power,(TBtu).

(e) Calculate the output-based Ni emissions rate in a lb/MWh format using Equation 2 of this section.

$$ER = \frac{M \times \text{conversion factor}}{TP_{\text{output-based}}} \qquad \text{(Eq. 2)}$$

Where:

ER = Ni emissions rate, (lb/MWh);
M = Total mass of Ni emissions, (mg);
Conversion factor = 2.205×10^{-6}; and
$TP_{\text{output-based}}$= Total power, (MWh).

§60.35f Reporting and recordkeeping guidelines.

For approval, a State plan shall include the reporting and recordkeeping provisions listed in §60.52a of subpart Cf of this part, as applicable.

§60.36f Compliance times.

(a) Except as provided for under paragraph (b) of this section, planning, awarding of contracts, and installation of electric utility steam generating unit air emission control equipment capable of meeting the emission guidelines established under §60.33f shall be accomplished within 30 months after the effective date of a State emission standard for electric utility steam generating units.

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Subpart Da–[AMENDED]

9. Subpart Da is amended by:

a. Redesignating §§60.45a through 60.49a as §§60.47a through 60.51a; and

b. Adding new sections §§60.45a and 60.46a to read as follows:

* * * * *

§60.45a. Standard for mercury.

(a) For each coal-fired electric utility steam generating unit other than an integrated gasification combined cycle (IGCC) electric utility steam generating unit, you must meet each mercury (Hg) emissions limit in paragraphs (a)(1) through (5) of this section that applies to you. The Hg emissions limits in paragraphs (a)(1) through (5) of this section are based on a 12-month rolling average using the procedures in §60.50a(h).

(1) For each coal-fired electric utility steam generating unit that burns only bituminous coal, you must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 6.0×10^{-6} pound per Megawatt hour (lb/MWh) or 0.0060 lb/gigawatt-hour (GWh) on an output basis. The SI equivalent is 0.00075 nanograms per joule (ng/J).

(2) For each coal-fired electric utility steam generating unit that burns only subbituminous coal, you must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 20×10^{-6} lb/MWh or 0.020 lb/GWh on an output basis. The SI equivalent is 0.0025 ng/J.

(3) For each coal-fired electric utility steam generating unit that burns only lignite, you must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 62×10^{-6}

lb/MWh or 0.062 lb/GWh on an output basis. The SI equivalent is 0.0078 ng/J.

(4) For each coal-burning electric utility steam generating unit that burns only coal refuse, you must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 1.1 x 10^{-6} lb/MWh or 0.0011 lb/GWh on an output basis. The SI equivalent is 0.00087 ng/J.

(5) For each coal-fired electric utility steam generating unit that burns a blend of coals from different coal ranks (i.e., bituminous coal, subbituminous coal, lignite) or a blend of coal and coal refuse, you must not discharge into the atmosphere any gases from a new affected source that contain Hg in excess of the monthly unit-specific Hg emissions limit established according to paragraph (a)(5)(i) or (ii) of this section, as applicable to your unit.

(i) If you operate a coal-fired electric utility steam generating unit that burns a blend of coals from different coal ranks or a blend of coal and coal refuse, you must not discharge into the atmosphere any gases from a new affected source that contain Hg in excess of the computed weighted Hg emissions limit based on the proportion of energy output (in Btu) contributed by each coal rank burned during the compliance period and its applicable Hg emissions limit in paragraphs (a)(1) through (4) of this section as determined using Equation 1 of this section. You must meet the weighted Hg emissions limit calculated using Equation 1 of this section by calculating the unit emission rate based on the total Hg loading of the unit and the total Btu or megawatt hours contributed by all fuels burned during the compliance period.

$$EL_b = \frac{\sum_{i=1}^{n} EL_i\left(HH_i\right)}{\sum_{i=1}^{n} HH_i} \qquad \text{(Eq. 1)}$$

Where:

EL_b = Total allowable Hg in lb/MWh that can be emitted to the atmosphere from any affected source being averaged under the blending provision.
EL_i = Hg emissions limit for the subcategory that applies to affected source i, lb/MWh.
HH_i = Electricity output from affected source i during the production period related to the corresponding H_i that falls within the compliance period, gross MWh generated by the electric utility steam generating unit.
n = Number of coal ranks being averaged for an affected source.

(ii) If you operate a coal-fired electric utility steam generating unit that burns a blend of coals from different coal ranks or a blend of coal and coal refuse together with one or more non-regulated, supplementary fuels, you must not discharge into the atmosphere any gases from the unit that contain Hg in excess of the computed weighted Hg emission limit based on the proportion of electricity output (in MWh) contributed by each coal rank burned during the compliance period and its applicable Hg emissions limit in paragraphs (a)(1) through (4) of this section as determined using Equation 1 of this section. You must meet the weighted Hg emissions limit calculated using Equation 1 of this section by calculating the unit emission rate based on the total Hg loading of the unit and the total megawatt hours contributed by both regulated and nonregulated fuels burned during the compliance period.

(b) For each IGCC electric utility steam generating unit, you must not discharge into the atmosphere any gases from a new affected source which contain Hg in excess of 20×10^{-6} lb/MWh or 0.020 lb/GWh on an output basis. The SI equivalent is 0.0025 ng/J. This Hg emissions limit is based on a 12-month rolling average using the procedures in §60.50a(g).

§60.46a. Standard for nickel.

(a) On and after the date on which the initial performance test required to be conducted under §60.8 is completed, the owner or operator of each oil-fired unit subject to the provisions of this subpart shall not discharge into the atmosphere any gases from an oil-fired electric utility steam generating unit which contain Ni in excess of 0.0008 lb/MWh on an output basis. The SI equivalent is 0.010 ng/J.

(b) The emissions limit for an oil-fired electric utility steam generating unit in paragraph (a) of this section does not apply if the owner or operator uses distillate oil as fuel. Except as noted in paragraph (e) of this section, the emissions limit in paragraph (a) of this section will apply immediately if the owner or operator subsequently uses a fuel other than distillate oil.

(c) If you use an ESP to meet a Ni emissions limit in this subpart, you must operate the ESP such that the hourly average voltage and secondary current (or total power input) do not fall below the limit established in the initial or subsequent performance test.

(d) If you use a control device or combination of control devices other than an ESP to meet the Ni emissions limit, or you wish to establish and monitor an alternative operating limit and alternative monitoring parameters for an ESP, you must apply to the Administrator for approval of alternative monitoring under §60.13(i).

(e) If you comply with the requirements in §60.46a(b) for switching fuel, and you must switch fuel because of an emergency, you must notify the Administrator in writing within 30 days of using a fuel other than distillate oil.

10. Section 60.48a is amended by:

a. Revising paragraph (c);

b. Revising paragraph (h) by changing the existing references from §60.47a to §60.49a;

c. Revising paragraph (i) by changing the existing references from §§60.47a(c), 60.47a(l), and 60.47a(k) to §§60.49a(c), 60.49a(l), and 60.49a(k), respectively;

d. Revising paragraph (j)(2) by changing the existing references from §60.47a to §60.49a in both cases where it is used;

e. Revising paragraph (k)(2)(ii) by changing the existing references from §60.47a and 60.47a(l) to §60.49a and 60.49a(l), respectively; revising paragraph (k)(2)(iii) by changing the existing references from §60.47a(k) to §60.49a(k); and revising paragraph (k)(2)(iv) by changing the existing references from §60.47a(l) to §60.49a(l); and

f. Adding new paragraphs (m) and (n).

The revision and additions read as follows:

<u>§60.48a Compliance provisions</u>.

*   *   *   *   *

(c) The particulate matter emission standards under §60.42a, the nitrogen oxides emission standards under §60.44a, the Hg emission standards under §60.45a, and the Ni emission standards under §60.46a apply at all times except during periods of startup, shutdown, or malfunction.* * *

*   *   *   *   *

(m) <u>Compliance provisions for sources subject to §60.45a</u>. The owner or operator of an affected facility subject to §60.45a (new sources constructed after [INSERT DATE OF PUBLICATION OF THE PROPOSED AMENDMENTS IN THE FEDERAL REGISTER]) shall calculate Hg emissions by multiplying the average hourly Hg output concentration measured according to the provisions of §60.49a(c) by the average hourly flow rate measured according to the provisions of §60.49a(l) and divided by the average hourly gross heat rate measured according to the provisions in §60.49a(k).

(n) <u>Compliance provisions for sources subject to §60.46a</u>. (1) The owner or operator of an affected facility subject to §60.46a(a) (new source constructed after [INSERT DATE OF PUBLICATION OF THE PROPOSED AMENDMENTS IN THE FEDERAL REGISTER]) shall calculate Ni emissions rate according to the procedures outlined in §60.50a(i).

11. Section 60.49a is amended by:

a. Revising paragraph (c)(2) to change the existing references from §60.49a to §60.51a in both cases where it is used;

b. Revising the existing references in paragraph (c)(5) from §60.47a(b) and (d) to §60.48a(b) and (d), respectively;

c. Revising the existing references in paragraph (d)(2) from §60.47a(c) and (d) to §60.48a(c) and (d), respectively;

d. Revising the existing references in paragraph (e)(2) from §60.46a(d)(1) to §60.47a(d)(1);

e. Revising paragraph (g) to change the existing reference from §60.46a to §60.48a.

f. Revising paragraph (k); and

g. Adding new paragraphs (p) through (s).

The revision and additions read as follows:

§60.49a Emission monitoring.

* * * * *

(k) The procedures specified in paragraphs (k)(1) through (3) of this section shall be used to determine compliance with the output-based standards under §§60.42a(c), 60.43a(i), 60.44a(d)(1), 60.44a(e), 60.45a, and 60.46a.

* * * * *

(p) The owner or operator of an affected facility demonstrating compliance with an Hg limit in §60.45a shall install and operate a continuous emissions monitoring system (CEMS) to measure and record the concentration of Hg in the exhaust gases from each stack according to the requirements in paragraphs (p)(1) through (3) of this section.

(1) The owner or operator must install, operate, and maintain each CEMS according to Performance

Specification 12A in 40 CFR part 60, appendix B.[3]

(2) The owner or operator must conduct a performance evaluation of each CEMS according to the requirements of §60.13 and Performance Specification 12A in 40 CFR part 60, appendix B.[1]

(3) The owner or operator must operate each CEMS according to the requirements in paragraphs (p)(3)(i) through (iv) of this section.

(i) As specified in §60.13(e)(2), each CEMS must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.

(ii) The owner or operator must reduce CEMS data as specified in §60.13(h).

(iii) Each CEMS must determine and record the 1 hour average emissions using all the hourly averages collected for periods during which the CEMS is not out of control.

(iv) The owner or operator must record the results of each inspection, calibration, and validation check.

(4) Mercury CEMS data collection must conform to

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[3] Performance Specification 12 is proposed elsewhere in today’s Federal Register.

paragraphs (4)(i) through (iv) of this section.

(i) A complete day of data for continuous monitoring is 18 hours or more in a 24-hour period.

(ii) A complete month of data for continuous monitoring is 21 days or more in a calendar month.

(iii) If you collect less than 21 days of continuous emissions data, you must discard the data collected that month and replace the data with the mean of the individual monthly emission rate values determined in the last 12 months.

(iv) If you collect less than 21 days per monthly period of continuous data again in that same 12-month rolling average cycle, you must discard the data collected that month and replace that data with the highest individual monthly emission rate determined in the last 12 months.

(q) As an alternative to the CEMS required in paragraph (p) of this section, the owner or operator must monitor Hg emissions using Method 324 in 40 CFR part 63, appendix A.[4]

(r) The owner or operator of an affected facility

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[4] Method 324 is proposed elsewhere in today's Federal Register.

which uses an ESP to meet a Ni limit in §60.46a shall install and operate a continuous parameter monitoring system (CPMS) to measure and record the voltage and secondary current (or total power input) to the control device according to the requirements in paragraphs (r)(1) through (3) of this section.

(1) Each CPMS must complete a minimum of one cycle of operation for each successive 15-minute period. The owner or operator must have a minimum of four successive cycles of operation to have a valid hour of data.

(2) Each CPMS must determine the 1-hour block average of all recorded readings.

(3) The owner or operator must record the results of each inspection, calibration, and validation check for a CPMS.

(s) The owner or operator shall prepare and submit to the Administrator for approval a unit-specific monitoring plan for each monitoring system. The owner or operator shall comply with the requirements in your plan. The plan must address the requirements in paragraphs (s)(1) through (6) of this section.

(1) Installation of the CMS sampling probe or other interface at a measurement location relative to each

affected process unit such that the measurement is representative of control of the exhaust emissions (e.g., on or downstream of the last control device);

(2) Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems;

(3) Performance evaluation procedures and acceptance criteria (e.g., calibrations);

(4) Ongoing operation and maintenance procedures in accordance with the general requirements of §60.13(d);

(5) Ongoing data quality assurance procedures in accordance with the general requirements of §60.13; and

(6) Ongoing recordkeeping and reporting procedures in accordance with the general requirements of §60.7.

12. Section 60.50a is amended by adding new paragraphs (g) through (i) to read as follows:

(g) For the purposes of determining compliance with the emission limits in §§60.45a and 60.46a, the owner or operator of an electric utility steam generating unit which is also a cogeneration unit shall use the procedures in paragraphs (g)(1) and (2) of this section to calculate emission rates based on electrical output to the grid plus half of the equivalent electrical energy in the unit’s process stream.

(1) All conversions from Btu/hr unit input to MWe unit output must use equivalents found in 40 CFR 60.40(a)(1) for electric utilities (i.e., 250 million Btu/hr input to a electric utility steam generating unit is equivalent to 73 MWe input to the electric utility steam generating unit); 73 MWe input to the electric utility steam generating unit is equivalent to 25 MWe output from the boiler electric utility steam generating unit; therefore, 250 million Btu input to the electric utility steam generating unit is equivalent to 25 MWe output from the electric utility steam generating unit).

(2) Use the Equation 1 of this section to determine the cogeneration Hg or Ni emission rate over a specific compliance period.

$$ER_{cogen} = \frac{E}{\left(\left(V_{grid}\right)+\left(\frac{V_{process}}{2}\right)\right)} \qquad \text{(Eq. 1)}$$

Where:

ER_{cogen} = Cogeneration Hg or Ni emission rate over a compliance period in lb/MWh;

E = Mass of Hg or Ni emitted from the stack over the same compliance period (lb);

V_{grid} = Amount of energy sent to the grid over the same compliance period (MWh); and

$V_{process}$ = Amount of energy converted to steam for process use over the same compliance period (MWh).

(h) The owner or operator shall determine compliance with the Hg limit in §60.45a according to the procedures in paragraphs (h)(1) through (3) of this section.

(1) The owner or operator shall demonstrate compliance by calculating the arithmetic average of all weekly emission rates for Hg for the 12 successive calendar months, except for data obtained during startup, shutdown, or malfunction.

(2) If a CEMS is used to demonstrate compliance, follow the procedures in paragraphs (h)(2)(i) through (ii) of this section to determine the 12-month rolling average.

(i) Calculate the total mass of Hg emissions over a month (M), in micrograms (µg), using Equation 2 of this section.

$$M = \int_0^t C(t)V(t)dt \tag{Eq. 2}$$

Where:

M = Total mass of Hg emissions,(μg);
C = Concentration of Hg recorded by CEMS per Performance Specification 12A[5] (40 CFR part 60, appendix B), micrograms per dry standard cubic meter (μg/dscm);
V = Volumetric flow rate recorded at the same frequency as the CEMS reading for the Hg concentration indicated in PS-12A, cubic meters per hour (dscm/hr); and
t = total time period over which mass measurements are collected, (hr).

(ii) Calculate the Hg emission rate for an output-based limit (lb/) using Equation 3 of this section:

$$ER = \frac{M \times \text{conversion factor}}{TP_{output-based}} \qquad \text{(Eq. 3)}$$

Where:

ER = Hg emission rate, (lb/);
M = Total mass of Hg emissions, (μg);
Conversion factor = 2.205×10^{-9}; and
$TP_{output\text{-}based}$ = Total power, megawatt-hours ().

(3) If you use Method 324[6] (40 CFR part 63, appendix B), determine the 12-month rolling average Hg emission rate according to the applicable procedures in paragraphs

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[5] Performance Specification 12A is proposed elsewhere in today’s Federal Register.

[6] EPA Method 324 is proposed elsewhere in today’s Federal Register.

(h)(3)(i) through (v) of this section.

(i) Sum the Hg concentrations for the emission rate period, (μg/dscm).

(ii) Calculate the total volumetric flow rate for the emission rate period, (dscm).

(iii) Multiply the total Hg concentration times the total volumetric rate to obtain the total mass of Hg for the emission rate period in micrograms.

(iv) Calculate the Hg emission rate for an output-based limit (lb/) using Equation 3 of this section.

(i) The owner or operator shall determine compliance with the Ni limit in §60.46a according to the procedures in paragraphs (i)(1) through (2) of this section.

(1) Ni emissions concentration for compliance under §60.46a is determined by the three-run average (nominal 1-hour runs) by Method 29 of 40 CFR part 60, Appendix A, for the initial and subsequent performance tests.

(2) Use the applicable procedures in paragraphs (2)(i) through (v) of this section to convert the Method 29 Ni emissions measurement to the output-based format for comparison to the §60.46a Ni emission limit.

(i) Sum the Ni concentrations obtained from the

Method 29 test runs, milligrams per dscm (mg/dscm).

(ii) Calculate the total volumetric flow rate obtained during the Method 29 test runs, (dscm).

(iii) Multiply the total Ni concentration times the total volumetric flow rate for the duration of the initial compliance testing period to obtain the total mass of Ni in milligrams.

(iv) Calculate the output-based Ni emissions rate in a lb/ format using Equation 4 of this section.

$$ER = \frac{M \times \text{conversion factor}}{TP_{output-based}} \qquad \text{(Eq. 4)}$$

Where:

ER = Ni emission rate, (lb/);
M = Total mass of Ni emissions, (mg);
Conversion factor = 2.205×10^{-6}; and
$TP_{output\text{-}based}$ = Total power, ().

(3) Compliance with the Ni emission limits under §60.46a is determined by the three-run average (nominal 1-hour runs) by Method 29 for the initial and subsequent performance tests.

13. Section 60.51a is amended by:

a. Revising paragraph (a);

b. Revising paragraph (c) by changing the existing references from §60.47a and §60.46a(h) to §60.49a and §60.48a(h), respectively;

c. Revising paragraph (d)(1) by changing the existing reference from §60.46a(d) to §60.48a(d);

d. Revising paragraph (e)(1) introductory text by changing the existing reference from §60.48a to §60.50a; and

The revision and additions read as follows:

<u>§60.51a Reporting requirements</u>.

(a) For sulfur dioxide, nitrogen oxides, particulate matter, Hg, and Ni emissions, the performance test data from the initial and subsequent performance test and from the performance evaluation of the continuous monitors (including the transmissometer) are submitted to the Administrator.

* * * * *

14. Section 60.52 is added to read as follows;

<u>§60.52a Recordkeeping requirements</u>.

The owner or operator of an affected facility subject to the emissions limitations in §60.45a or §60.46a shall maintain records of all information needed to demonstrate compliance including performance tests, monitoring data, fuel analyses, and calculations.

15. Appendix B to part 60 is amended by adding in numerical order new Performance Specification 12A to read as follows:

PERFORMANCE SPECIFICATION 12A - SPECIFICATIONS AND TEST PROCEDURES FOR TOTAL VAPOR PHASE MERCURY CONTINUOUS EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES

1.0 Scope and Application.

1.1 Analyte.

Analyte	CAS No.
Mercury (Hg)	7439-97-6

1.2 Applicability.

1.2.1 This specification is for evaluating the acceptability of total vapor phase Hg continuous emission monitoring systems (CEMS) installed on the exit gases from fossil fuel fired boilers at the time of or soon after installation and whenever specified in the regulations. The Hg CEMS must be capable of measuring the total concentration in $\mu g/m^3$ (regardless of speciation) of vapor phase Hg, and recording that concentration on a dry basis, corrected to 20 degrees C and 7 percent CO_2. Particle bound Hg is not included. The CEMS must include a) a diluent (CO_2) monitor, which must meet Performance Specification 3 in 40 CFR part 60, appendix B, and b) an automatic sampling system. Existing diluent and flow monitoring equipment can be used.

This specification is not designed to evaluate an installed CEMS's performance over an extended period of time nor does it identify specific calibration techniques and auxiliary procedures to assess the CEMS's performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS properly. The Administrator may require, under CAA section 114, the operator to conduct CEMS performance evaluations at other times besides the initial test to evaluate the CEMS performance. See 40 CFR 60.13(c).

2.0 Summary of Performance Specification.

Procedures for measuring CEMS relative accuracy, measurement error and drift are outlined. CEMS installation and measurement location specifications, and data reduction procedures are included. Conformance of the CEMS with the Performance Specification is determined.

3.0 Definitions.

3.1 Continuous Emission Monitoring System (CEMS)

means the total equipment required for the determination of a pollutant concentration. The system consists of the following major subsystems:

3.2 Sample Interface means that portion of the CEMS used for one or more of the following: sample acquisition, sample transport, sample conditioning, and protection of the monitor from the effects of the stack effluent.

3.3 Hg Analyzer means that portion of the CEMS that measures the total vapor phase Hg mass concentration and generates a proportional output.

3.4 Diluent Analyzer (if applicable) means that portion of the CEMS that senses the diluent gas (CO_2) and generates an output proportional to the gas concentration.

3.5 Data Recorder means that portion of the CEMS that provides a permanent electronic record of the analyzer output. The data recorder can provide automatic data reduction and CEMS control capabilities.

3.6 Span Value means the upper limit of the intended Hg concentration measurement range. The span value is a value equal to two times the emission standard.

3.7 <u>Measurement Error (ME)</u> means the difference between the concentration indicated by the CEMS and the known concentration generated by a reference gas when the entire CEMS, including the sampling interface, is challenged. An ME test procedure is performed to document the accuracy and linearity of the CEMS at several points over the measurement range.

3.8 <u>Upscale Drift (UD)</u> means the difference in the CEMS output responses to a Hg reference gas when the entire CEMS, including the sampling interface, is challenged after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.9 <u>Zero Drift (ZD)</u> means the difference in the CEMS output responses to a zero gas when the entire CEMS, including the sampling interface, is challenged after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.10 <u>Relative Accuracy (RA)</u> means the absolute mean difference between the pollutant concentration(s) determined by the CEMS and the value determined by the reference method (RM) plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests or the applicable emission limit.

4.0 Interferences. [Reserved]

5.0 Safety.

The procedures required under this performance specification may involve hazardous materials, operations, and equipment. This performance specification may not address all of the safety problems associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures. The CEMS user’s manual and materials recommended by the reference method should be consulted for specific precautions to be taken.

6.0 Equipment and Supplies.

6.1 CEMS Equipment Specifications.

6.1.1 Data Recorder Scale. The CEMS data recorder output range must include zero and a high level value. The high level value must be approximately 2 times the Hg concentration corresponding to the emission standard level for the stack gas under the circumstances existing as the stack gas is sampled. If a lower high level value is used, the CEMS must have the capability of providing multiple high level values (one of which is equal to the span value) or be capable of automatically changing the high level value as required (up to specified high level value) such that the measured value does not exceed 95 percent of the high level value.

6.1.2 The CEMS design should also provide for the determination of response drift at both the zero and mid-level value. If this is not possible or practical, the design must allow these determinations to be conducted at a low-level value (zero to 20 percent of the high-level value) and at a value between 50 and 100 percent of the high-level value.

6.2 Reference Gas Delivery System. The reference gas delivery system must be designed so that the flowrate of reference gas introduced to the CEMS is the same at all three challenge levels specified in Section 7.1 and at all times exceeds the flow requirements of the CEMS.

6.3 Other equipment and supplies, as needed by the applicable reference method used. See Section 8.6.2.

7.0 Reagents and Standards.

7.1 Reference Gases.

7.1.1 Zero - N_2 or Air. Less than 0.1 μg Hg/m^3.

7.1.2 Mid-level Hg^0 and $HgCl_2$. 40 to 60 percent of span.

7.1.3 High-level Hg^0 and $HgCl_2$. 80 to 100 percent of span.

7.2 Reagents and Standards. May be required for the reference methods. See Section 8.6.2.

8.0 Performance Specification Test Procedure.

8.1 Installation and Measurement Location Specifications.

8.1.1 CEMS Installation. Install the CEMS at an accessible location downstream of all pollution control equipment. Since the Hg CEMS sample system normally extracts gas from a single point in the stack, use a location that has been shown to be free of stratification for SO_2 and NO_x through concentration measurement traverses for those gases. If the cause of failure to meet the RA test requirement is determined to be the measurement location and a satisfactory correction technique cannot be established, the Administrator may require the CEMS to be relocated.

Measurement locations and points or paths that are most likely to provide data that will meet the RA requirements are listed below.

8.1.2 Measurement Location. The measurement location should be (1) at least eight equivalent diameters downstream of the nearest control device, point of pollutant generation, bend, or other point at which a change of pollutant concentration or flow disturbance may occur, and (2) at least two equivalent diameters upstream from the effluent exhaust. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, Method 1.

8.1.3 Hg CEMS Sample extraction Point. Use a sample extraction point (1) no less than 1.0 meter from the stack or duct wall, or (2) within the centroidal velocity traverse area of the stack or duct cross section.

8.2 Reference Method (RM) Measurement Location and Traverse Points. The RM measurement location should be at a point or points in the same stack cross sectional area as the CEMS is located, according to the criteria above. The RM and CEMS locations need not be immediately adjacent. They should be as close as possible without causing interference with one another.

8.3 Measurement Error (ME) Test Procedure. The Hg CEMS must be constructed to permit the introduction of known (NIST traceable) concentrations of elemental mercury (Hg^0) and mercuric chloride ($HgCl_2$) separately into the sampling system of the CEMS immediately preceding the sample extraction filtration system such that the entire CEMS can be challenged. Inject sequentially each of the three reference gases (zero, mid-level, and high level) for each Hg species. CEMS measurements of each reference gas shall not differ from their respective reference values by more than 5 percent of the span value. If this specification is not met, identify and correct the problem before proceeding.

8.4 Upscale Drift (UD) Test Procedure.

8.4.1 UD Test Period. While the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart, determine the magnitude of the UD once each day (at 24-hour intervals) for 7 consecutive days according to the procedure given in Sections 8.4.2 through 8.4.3.

8.4.2 The purpose of the UD measurement is to verify the ability of the CEMS to conform to the established CEMS response used for determining emission concentrations or emission rates. Therefore, if periodic automatic or manual adjustments are made to the CEMS zero and response settings, conduct the UD test immediately before these adjustments, or conduct it in such a way that the UD can be determined.

8.4.3 Conduct the UD test at the mid-level point specified in Section 7.1. Evaluate upscale drift for elemental Hg (Hg^0) only. Introduce the reference gas to the CEMS. Record the CEMS response and subtract the reference value from the CEM value (see example data sheet in Figure 12A-1).

8.5 Zero Drift (ZD) Test Procedure.

8.5.1 ZD Test Period. While the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart, determine the magnitude of the ZD once each day (at 24-hour intervals) for 7 consecutive days according to the procedure given in Sections 8.5.2 through 8.5.3.

8.5.2 The purpose of the ZD measurement is to verify the ability of the CEMS to conform to the established CEMS response used for determining emission concentrations or emission rates. Therefore, if periodic automatic or manual adjustments are made to the CEMS zero and response settings, conduct the ZD test immediately before these adjustments, or conduct it in such a way that the ZD can be determined.

8.5.3 Conduct the ZD test at the zero level specified in Section 7.1. Introduce the zero gas to the CEMS. Record the CEMS response and subtract the zero value from the CEM value (see example data sheet in Figure 12A-1).

8.6 Relative Accuracy (RA) Test Procedure.

8.6.1 RA Test Period. Conduct the RA test according to the procedure given in Sections 8.6.2 through 8.6.6 while the affected facility is operating at normal full load, or as specified in an applicable subpart. The RA test can be conducted during the UD test period.

8.6.2 Reference Method (RM). Unless otherwise specified in an applicable subpart of the regulations, use either Method 29 in appendix A to 40 CFR part 60, or ASTM Method D 6784-02 (incorporated by reference in §60.17) as the RM for Hg. Do not include the filterable portion of the sample when making comparisons to the CEMS results. Conduct all RM tests with paired or duplicate sampling systems.

8.6.3 Sampling Strategy for RM Tests. Conduct the RM tests in such a way that they will yield results representative of the emissions from the source and can be compared to the CEMS data. It is preferable to conduct the diluent (if applicable), moisture (if needed), and Hg measurements simultaneously. However, diluent and moisture measurements that are taken within an hour of the Hg measurements can used to adjust the results to a consistent basis. In order to correlate the CEMS and RM data properly, note the beginning and end of each RM test period for each paired RM run (including the exact time of day) on the CEMS chart recordings or other permanent record of output.

8.6.4 Number and length of RM Tests. Conduct a minimum of nine paired sets of all necessary RM test runs that meet the relative standard deviation criteria of this PS. Use a minimum sample run time of 2 hours for each pair.

NOTE: More than nine paired sets of RM tests can be performed. If this option is chosen, test results can be rejected so long as the total number of paired RM test results used to determine the CEMS RA is greater than or equal to nine. However, all data must be reported, including the rejected data.

8.6.5 Correlation of RM and CEMS Data. Correlate the CEMS and the RM test data as to the time and duration by first determining from the CEMS final output (the one used for reporting) the integrated average pollutant concentration or emission rate for each pollutant RM test period. Consider system response time, if important, and confirm that the results are on a consistent moisture, temperature, and diluent concentration basis with the paired RM test. Then, compare each integrated CEMS value against the corresponding average of the paired RM values.

8.6.6 Paired RM Outliers.

8.6.6.1 Outliers are identified through the determination of precision and any systematic bias of the paired RM tests. Data that do not meet this criteria should be flagged as a data quality problem. The primary reason for performing dual RM sampling is to generate information to quantify the precision of the RM data. The relative standard deviation (RSD) of paired data is the parameter used to quantify data precision. Determine RSD for two simultaneously gathered data points as follows:

$$RSD = 100\% * \left|\left(Ca - Cb\right)\right| / (Ca + Cb)$$

Eq. 12A-1

where Ca and Cb are concentration values determined from trains A and B respectively. For RSD calculation, the concentration units are unimportant so long as they are consistent.

8.6.6.2 A minimum precision criteria for RM Hg data is that RSD for any data pair must be ≤10 percent as long as the mean Hg concentration is greater than 1.0 μg/m^3. If the mean Hg concentration is less than or equal to 1.0 μg/m^3, the RSD must be ≤20 percent. Pairs of RM data exceeding these RSD criteria should be eliminated from the data set used to develop a Hg CEMS correlation or to assess CEMS RA.

8.6.7 Calculate the mean difference between the RM and CEMS values in the units of the emission standard, the standard deviation, the confidence coefficient, and the RA according to the procedures in Section 12.0.

8.7 Reporting. At a minimum (check with the appropriate EPA Regional Office, State, or local Agency for additional requirements, if any), summarize in tabular form the results of the RD tests and the RA tests or alternative RA procedure, as appropriate. Include all data sheets, calculations, charts (records of CEMS responses), reference gas concentration certifications, and any other information necessary to confirm that the performance of the CEMS meets the performance criteria.

9.0 Quality Control. [Reserved]

10.0 Calibration and Standardization. [Reserved]

11.0 Analytical Procedure.

Sample collection and analysis are concurrent for this Performance Specification (see Section 8.0). Refer to the RM employed for specific analytical procedures.

12.0 Calculations and Data Analysis.

Summarize the results on a data sheet similar to that shown in Figure 2-2 for Performance Specification 2.

12.1 Consistent Basis. All data from the RM and CEMS must be on a consistent dry basis and, as applicable, on a consistent diluent basis. Correct the RM and CEMS data for moisture and diluent as follows:

12.1.1 Moisture Correction (as applicable). Correct each wet RM run for moisture with the corresponding Method 4 data; correct each wet CEMS run using the corresponding CEMS moisture monitor date using Equation 12A-2.

$$\text{Concentration}_{(dry)} = \frac{\text{Concentration}_{(wet)}}{(1-B_{ws})} \quad \text{Eq. 12A-2}$$

12.1.2 Correction to Units of Standard (as applicable). Correct each dry RM run to the units of the emission standard with the corresponding Method 3B data; correct each dry CEMS run using the corresponding CEMS diluent monitor data as follows:

12.1.3 Correct to Diluent Basis. The following is an example of concentration (ppm) correction to 7 percent oxygen.

$$ppm_{(corr)} = ppm_{(uncorr)}\left[\frac{20.9-7.0}{20.9-\%O_{2(dry)}}\right] \quad \textbf{Eq. 12A-3}$$

The following is an example of mass/gross calorific value (lbs/million Btu) correction.

lbs/MMBtu = $Conc_{(dry)}$ (F-factor) ((20.9/(20.9 - percent O_2))

12.2 Arithmetic Mean. Calculate the arithmetic mean of the difference, d, of a data set as follows:

$$\bar{d} = \frac{1}{n}\sum_{i=1}^{n} d_i \qquad \textbf{Eq. 12A-4}$$

Where:

n = Number of data points.

12.3 Standard Deviation. Calculate the standard deviation, S_d, as follows:

$\sum_{i=1}^{n} d_i$ = Algebraic summation of the individual differences

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left[\sum_{i=1}^{n} d_i\right]^2}{n}}{n-1} \right]^{\frac{1}{2}} \qquad \text{Eq. 12A-5}$$

$$RA = \frac{|\bar{d}| + |CC|}{\overline{RM}} \times 100 \qquad \text{Eq. 12A-7}$$

12.4 Confidence Coefficient. Calculate the 2.5 percent error confidence coefficient (one-tailed), CC, as follows:

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}} \qquad \text{Eq. 12A-6}$$

12.5 Relative Accuracy. Calculate the RA of a set of data as follows:

where:

Where:

$|\bar{d}|$ = Absolute value of the mean differences (from Equation 12A-4).

$|CC|$ = Absolute value of the confidence coefficient (from Equation 12A-6).

$\overline{RM}$ = Average RM value. In cases where the average emissions for the test are less than 50 percent of the applicable standard, substitute the emission standard value in the denominator of Eq. 12A-7 in place of $\overline{RM}$. In all other cases, use $\overline{RM}$.

13.0 Method Performance.

13.1 Measurement Error (ME). ME is assessed at mid-level and high-level values as given below using standards for both Hg^0 and $HgCl_2$. The mean difference between the indicated CEMS concentration and the reference concentration value for each standard shall be no greater than 5 percent of span. The same difference for the zero reference gas shall be no greater than 5 percent of span.

13.2 Upscale Drift (UD). The CEMS design must allow the determination of UD of the analyzer. The CEMS response can not drift or deviate from the benchmark value of the reference standard by more than 5 percent of span for the mid level value. Evaluate upscale drift for Hg^0 only.

13.3 Zero Drift (ZD). The CEMS design must allow the determination of drift at the zero level. This drift shall not exceed 5 percent of span.

13.4 Relative Accuracy (RA). The RA of the CEMS must be no greater than 20 percent of the mean value of the RM test data in terms of units of the emission standard, or 10 percent of the applicable standard, whichever is greater.

14.0 Pollution Prevention. [Reserved]

15.0 Waste Management. [Reserved]

16.0 Alternative Procedures. [Reserved]

17.0 Bibliography.

17.1 40 CFR part 60, appendix B, “Performance Specification 2 - Specifications and Test Procedures for SO_2 and NO_X Continuous Emission Monitoring Systems in Stationary Sources”.

17.2 40 CFR part 60, appendix A, “Method 29 - Determination of Metals Emissions from Stationary Sources”.

17.3 ASTM Method 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)”.

18.0 Tables and Figures.

TABLE 12A-1. t-VALUES.

n^a	$t_{0.975}$	n^a	$t_{0.975}$	n^a	$t_{0.975}$
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179

4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145
6	2.571	11	2.228	16	2.131

[a] The values in this table are already corrected for n-1 degrees of freedom. Use n equal to the number of individual values.

	Day	Date and Time	Reference Value (C)	CEMS Value (M)	Measurement Error	Drift
Zero Level						
Mid-level						
High-level						

Figure 12A-1. Zero and Upscale Drift Determination.

PART 63--[AMENDED]

16. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401, et seq.

17. Section 63.14 is amended by adding paragraph (b)(35) to read as follows:

§63.14 Incorporation by Reference.

* * * * *

(b)(35) 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), for appendix B to part 63, Method 324.

18. Appendix B to part 63 is amended by adding in numerical order new Method 324 to read as follows:

METHOD 324 – DETERMINATION OF VAPOR PHASE FLUE GAS MERCURY EMISSIONS FROM STATIONARY SOURCES USING DRY SORBENT TRAP SAMPLING

1.0 Introduction.

This method describes sampling criteria and procedures for the continuous sampling of mercury (Hg) emissions in combustion flue gas streams using sorbent traps. Analysis of each trap can be by cold vapor atomic fluorescence spectrometry (AF) which is described in this method, or by cold vapor atomic absorption spectrometry (AA). Only the AF analytical method is detailed in this method, with reference being made to other published methods for the AA analytical procedure. The Electric Power Research Institute has investigated the AF analytical procedure in the field with the support of ADA-ES and Frontier Geosciences, Inc. The AF procedure is based on EPA Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry. Persons using this method should have a thorough working knowledge of Methods 1, 2, 3, 4 and 5 of 40 CFR part 60, appendix A.

1.1 Scope and Application.

1.1.1 Analytes. The analyte measured by this method is total vapor-phase Hg, which represents the sum of elemental (CAS Number 7439-97-6) and oxidized forms of Hg, mass concentration (micrograms/dscm) in flue gas samples.

1.1.2 Applicability. This method is applicable to the determination of vapor-phase Hg concentrations ranging from 0.03 µg/dncm to 100 µg/dncm in low-dust applications, including controlled and uncontrolled emissions from stationary sources, only when specified within the regulations. When employed to demonstrate compliance with an emission regulation, paired sampling is to be performed as part of the method quality control procedure. The method is appropriate for flue gas Hg measurements from combustion sources. Very low Hg concentrations will require greater sample volumes. The method can be used over any period from 30 minutes to several days in duration, provided appropriate sample volumes are collected and all the quality control criteria in Section 9.0 are met. When sampling for periods greater than 12 hours, the sample rate is required to be maintained at a constant proportion to the total stack flowrate, ±25 percent to ensure representativeness of the sample collected.

2.0 Summary of Method.

Known volumes of flue gas are extracted from a duct through a single or paired sorbent traps with a nominal flow rate of 0.2 to 0.6 liters per minute through each trap. Each trap is then acid leached and the resulting leachate is analyzed by cold vapor atomic fluorescence spectrometry (CVAFS) detection. The AF analytical procedure is described in detail in EPA Method 1631. Analysis by AA can be performed by existing recognized procedures, such as that contained in ASTM Method D6784-02 (incorporated by reference, see §63.14) or EPA Method 29.

3.0 Definitions. [Reserved]

4.0 Clean Handling and Contamination.

During preparation of the sorbent traps, as well as transport, field handling, sampling, recovery, and laboratory analysis, special attention must be paid to cleanliness procedures. This is to avoid Hg contamination of the samples, which generally contain very small amounts of Hg. For specifics on how to avoid contamination, Section 4 of Method 1631 should be well understood.

5.0 Safety.

5.1 Site hazards must be prepared for in advance of applying this method in the field. Suitable clothing to protect against site hazards is required, and requires advance coordination with the site to understand the conditions and applicable safety policies. At a minimum, portions of the sampling system will be hot, requiring appropriate gloves, long sleeves, and caution in handling this equipment.

5.2 Laboratory safety policies are to minimize risk of chemical exposure and to properly handle waste disposal. Personnel will don appropriate laboratory attire according to a Chemical Hygiene Plan established by the laboratory. This includes, but is not limited to, laboratory coat, safety goggles, and nitrile gloves under clean gloves.

5.3 The toxicity or carcinogenicity of reagents used in this method has not been fully established. The procedures required in this method may involve hazardous materials, operations, and equipment. This method may not address all of the safety problems associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures. Each chemical should be regarded as a potential health hazard and exposure to these compounds should be minimized. Chemists should refer to the MSDS for each chemical with which they are working.

5.4 Any wastes generated by this procedure must be disposed of according to a hazardous materials management plan that details and tracks various waste streams and disposal procedures.

6.0 Equipment and Supplies.

6.1 Hg Sampling Train. A Schematic of a single trap sampling train used for this method is shown in Figure 324-1. Where this method is used to collect data to demonstrate compliance with a regulation, it must be performed with paired sorbent trap equipment.

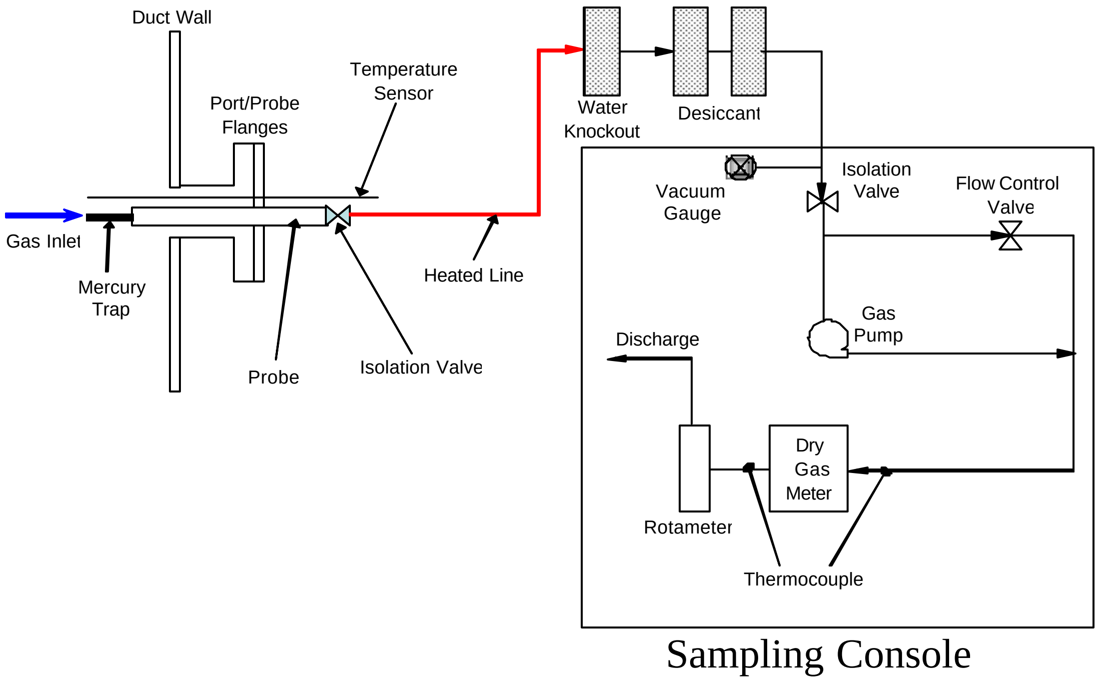

Figure 324-1. Hg Sampling Train illustrating Single

Trap.

6.1.1 Sorbent Trap. Use sorbent traps with separate main and backup sections in series for collection of Hg. Selection of the sorbent trap shall be based on: 1) achievement of the performance criteria of this method, and 2) data is available to demonstrate the method can pass the criteria in EPA Method 301 when used in this method and when the results are compared with those from EPA Method 29, EPA Method 101A, or ASTM Method 6784-02 for the measurement of vapor-phase Hg in a similar flue gas matrix. Appropriate traps are referred to as “sorbent trap” throughout this method. The method requires the analysis of Hg in both main and backup portions of the sorbent within each trap. The sorbent trap should be obtained from a reliable source that has clean handling procedures in place for ultra low-level Hg analysis. This will help assure the low Hg environment required to manufacture sorbent traps with low blank levels of Hg. Sorbent trap sampling requirements or needed characteristics are shown in Table 324-1. Blank/cleanliness and other requirements are described in Table 324-2. The sorbent trap is supported on a probe and inserted directly into the flue gas stream, as shown on Figure 324-1. The sampled sorbent trap is the entire Hg sample.

6.1.2 Sampling Probe. The probe assembly shall have a leak-free attachment to the sorbent trap. For duct temperatures from 200 to 375°F, no heating is required. For duct temperatures less than 200°F, the sorbent tube must be heated to at least 200°F or higher to avoid liquid condensation in the sorbent trap by using a heated probe. For duct temperatures greater than 375°F, a large sorbent trap must be used, as shown in Table 324-1, and no heating is required. A thermocouple is used to monitor stack temperature.

6.1.3 Umbilical Vacuum Line. A 250°F heated umbilical line shall be used to convey to the moisture knockout the sampled gas that has passed through the sorbent trap and probe assembly.

6.1.4 Moisture Knockout. Impingers and desiccant can be combined to dry the sample gas prior to entering the dry gas meter. Alternative sample drying methods are acceptable as long as they do not affect sample volume measurement.

6.1.5 Vacuum Pump. A leak tight vacuum pump capable of delivering a controlled extraction flow rate between 0.1 to 0.8 liters per minute.

6.1.6 Dry Gas Meter. Use a dry gas meter that is calibrated according to the procedures in 40 CFR part 60, appendix A, Method 5, to measure the total sample volume collected. The dry gas meter must be sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate and conditions actually encountered during sampling, and equipped with a temperature sensor capable of measuring typical meter temperatures accurately to within 3°C (5.4°F).

6.2 Sample Analysis Equipment. Laboratory equipment as described in Method 1631, Sections 6.3 to 6.7 is required for analysis by AF. For analysis by AA, refer to Method 29 or ASTM Method 6784-02.

Table 324-1. Sorbent Trap and Sampling Requirements.

Item to be determined	Small Sorbent Trap	Large Sorbent Trap
Sampling Target: Hg Loading Range, ug	Minimum = 0.025 µg/trap Maximum = 150 µg/trap	Minimum = 0.10 µg/trap Maximum = 1800 µg/trap
Sampling Duration Required: limits on sample times	Minimum = 30 minutes Maximum = 24 hours	Minimum = 24 hours Maximum = 10 days
Sampling Temperature Required	200 to 375°F	200 to 425°F
Sampling Rate Required	0.2 to 0.6 L/min; start at 0.4 L/min Must be constant proportion within +/-25% if greater than 12 hours; constant rate within +/-25% if less	0.2 to 0.6 L/min; start at 0.4 L/min Must be constant proportion of stack flowrate within +/-25%

	than 12 hours.	

7.0 Analysis by AF, Reagents and Standards.

For analysis by AF, use Method 1631, Sections 7.1 – 7.3 and 7.5 – 7.12 for laboratory reagents and standards. Refer to Method 29 or ASTM Method 6784-02 for analysis by AA.

7.1 Reagent Water. Same as Method 1631, Section 7.1.

7.2 Air. Same as Method 1631, Section 7.2.

7.3 Hydrochloric Acid. Same as Method 1631, Section 7.3.

7.4 Stannous Chloride. Same as Method 1631, Section 7.5.

7.5 Bromine Monochloride (BrCl, 0.01N). Same as Method 1631, Section 7.6.

7.6 Hg Standards. Same as Method 1631, Sections 7.7 to 7.11.

7.7 Nitric Acid. Reagent grade, low Hg.

7.8 Sulfuric Acid. Reagent grade, low Hg.

7.9 Nitrogen. Same as Method 1631, Section 7.12.

7.10 Argon. Same as Method 1631, Section 7.13.

8.0 Sample Collection and Transport.

8.1 Pre-Test.

8.1.1 Site information should be obtained in accordance with Method 1 (40 CFR part 60, appendix A). Identify a location that has been shown to be free of stratification for SO_2 and NO_x through concentration measurement traverses for those gases. An estimation of the expected Hg concentration is required to establish minimum sample volumes. Based on estimated minimum sample volume and normal sample rates for each size trap used, determine sampling duration with the data provided in Table 324-1.

8.1.2 Sorbent traps must be obtained from a reliable source such that high quality control and trace cleanliness are maintained. Method detection limits will be adversely affected if adequate cleanliness is not maintained. Sorbent traps should be handled only with powder-free low Hg gloves (vinyl, latex, or nitrile are acceptable) that have not touched any other surface. The sorbent traps should not be removed from their clean storage containers until after the preliminary leak check has been completed. Field efforts at clean handling of the sorbent traps are key to the success of this method.

8.1.3 Assemble the sample train according to Figure

324-1, except omit the sorbent trap.

8.1.4 Preliminary Leak Check. Perform system leak check without the single or dual sorbent traps in place. This entails plugging the end of the probe to which each sorbent trap will be affixed, and using the vacuum pump to draw a vacuum in each sample train. Adjust the vacuum in the sample train to 15 inches Hg. A rotameter on the dry gas meter will indicate the leakage rate. The leakage rate must be less than 2 percent of the planned sampling rate.

8.1.5 Release the vacuum in the sample train, turn off the pump, and affix the sorbent trap to the end of the probe, using clean handling procedures. Leave the flue gas end of the sorbent trap plugged.

8.1.6 Pre-test leak check. Perform a leak check with the Sorbent trap in place. Use the sampling vacuum pump to draw a vacuum in the sample train. Adjust the vacuum in the sample train to 15 inches Hg. A rotameter on the dry gas meter will indicate the leakage rate. Record the leakage rate. The leakage rate must be less than 2 percent of the planned sampling rate. Once the leak check passes this criterion, carefully release the vacuum in the sample train (the sorbent trap must not be exposed to abrupt changes in pressure or to backflow), then re-cap the flue gas end of the sorbent trap until the probe is ready for insertion. The sorbent trap packing beds must be undisturbed by the leak test to prevent gas channeling through the media during sampling.

8.1.7 Use temperature controllers to heat the portions of the trains that require it. The sorbent trap must be maintained between 200 and 375 °F during sampling.

8.1.8 Gas temperature and static pressure must be considered prior to sampling in order to maintain proper safety precautions during sampling.

8.2 Sample Collection.

8.2.1 Remove the plug from the end of a sorbent trap and store it in a clean sorbent trap storage container. Remove the sample duct port cap and insert the probe. Secure the probe and ensure that no leakage occurs between the duct and environment.

8.2.2 Record initial data including the start time, starting dry gas meter readings, and the name of the field tester(s). Set the initial sample flow rate to 0.4 L/min (+/- 25 percent).

8.2.3 For constant-flow sampling (samples less than

12 hours in duration), every 10-15 minutes during the sampling period: record the time, the sample flow rate, the gas meter readings, the duct temperature, the flow meter temperatures, temperatures of heated equipment such as the vacuum lines and the probes (if heated), and the sampling vacuum reading. Adjust the sample rate as needed, maintaining constant sampling within +/- 25 percent of the initial reading.

8.2.4 For constant proportion sampling (samples 12 hours or greater in duration), every hour during the sampling period: record the time, the sample flow rate, the gas meter readings, the duct temperature, the flow meter temperatures, temperatures of heated equipment such as the vacuum lines and the probes (if heated), and the sampling vacuum readings. Also record the stack flow rate reading, whether provided as a CEM flow monitor signal, a pitot probe or other direct flow indication, or a plant input signal. Adjust the sampling rate to maintain proportional sampling within +/- 25 percent relative to the total stack flowrate.

8.2.5 Obtain and record operating data for the facility during the test period, including total stack flowrate and the oxygen concentration at the flue gas test location. Barometric pressure must be obtained for correcting sample volume to standard conditions.

8.2.6 Post Test Leak Check. When sampling is completed, turn off the sample pump, remove the probe from the port and carefully re-plug the end of the sorbent trap. Perform leak check by turning on the sampling vacuum pumps with the plug in place. The rotameter on the dry gas meters will indicate the leakage rates. Record the leakage rate and vacuum. The leakage rate must be less than 2 percent of the actual sampling rate. Following the leak check, carefully release the vacuum in the sample train.

8.2.7 Sample Recovery. Recover each sampled sorbent trap by removing it from the probe, plugging both ends with the clean caps provided with the sorbent trap, and then wiping any dirt off the outside of the sorbent trap. Place the sorbent trap into the clean sample storage container in which it was provided, along with the data sheet that includes the post-test leak check, final volume, and test end time.

8.3 Quality Control Samples and Requirements.

8.3.1 Field blanks. Refer to Table 324-2.

8.3.2 Duplicate (paired or side by side) samples.

Refer to Section 8.6.6 of Performance Specification 12A of 40 CFR part 60, appendix B for this criteria.

8.3.3 Breakthrough performance data ("B" bed in each trap, or second traps behind). Refer to Table 324-2.

8.3.4 Field spikes (sorbent traps spiked with Hg in the lab and periodically sampled in the field to determine overall accuracy). Refer to Table 324-2.

8.3.5 Laboratory matrix and matrix spike duplicates. Refer to Table 324-2.

9.0 <u>Quality Control</u>.

Table 324-2 summarizes the major quantifiable QC components.

Table 324-2. Quality Control for Samples

QA/QC Specification	Acceptance Criteria	Frequency	Corrective Action
Leak-check	<2% of sampling rate	Pre and post-sampling	Pre-sampling: repair leak. Post-sampling: Flag data and repeat run if for regulatory compliance.
Sample Flow Rate for samples less than 12 hours in duration	0.4 L/min initially and +/-25% of initial rate throughout run	Throughout run every 10-15 minutes	Adjust when data is recorded.
Sample Flow Rate for samples greater than 12 hours in duration	0.4 L/min initially and maintain +/-25% of ratio to flue gas flow rate	Throughout run every hour	Adjust when data is recorded

	throughout sampling		
Sorbent trap laboratory blank (same lot as samples)	<5 ng/trap and a standard deviation of <1.0 ng/trap (n=3)	3 per analysis set of 20 sorbent traps	
Sorbent trap field blank (same lot as samples)	<5 ng/trap and a standard deviation of <1.0 ng/trap (n=3) OR <5% of average sample collected	1 per every 10 field samples collected	
B-Trap Bed Analysis	<2% of A-Trap Bed Value OR < 5 ng/trap	Every sample	
Paired Train Results	Same as Section 8.6.6 of PS-12A of 40CFR Par60, Appendix B		
Field Spikes	80 % to 120% recovery	For long-term regulatory monitoring, 1 per every 3 samples for the first 12 samples	If the first 4 field spikes do not meet the +/-20% criteria, take corrective sampling and laboratory measures and repeat at the 1 per every 3 sample rate until the +/-20% criteria is met.
Laboratory matrix and matrix spike duplicates	85% to 115% recovery	1 per every 10 or 20 samples-to be determined	

10.0 Calibration and Standards.

Same as Sections 10.1, 10.2 and 10.4 of Method 1631.

10.1 Calibration and Standardization. Same as Sections 10.1 and 10.4 of Method 1631.

10.2 Bubbler System. Same as Section 10.2 of M1631.

10.3 Flow-Injection System. Not applicable.

11.0 Analytical Procedures.

11.1 Preparation Step. The sorbent traps are received and processed in a low-Hg environment (class-100 laminar-flow hood and gaseous Hg air concentrations below 20 ng/m^3) following clean-handling procedures. Any dirt or particulate present on the exterior of the trap must be removed to avoid contamination of the sample. The sorbent traps are then opened and the sorbent bed(s) transferred to an appropriate sized trace-clean vessel. It is recommended that the height of the trace-clean vessel be at least 3 times the diameter to facilitate a refluxing action.

11.2 Leaching Step. The sorbent trap is then subjected to a hot-acid leach using a 70:30 ratio mixture of concentrated HNO_3/H_2SO_4. The acid volume must be 40 percent of the expected end volume of the digest after dilution. The HNO_3/H_2SO_4 acid to carbon ratio should be approximately 35:1. The leachate is then heated to a temperature of 50 to 60°C for 1.5 to 2.0 hours in the finger-tight capped vessels. This process may generate significant quantities of noxious and corrosive gasses and must only be performed in a well-ventilated fume hood. Care must be taken to prevent excessive heated leaching of the samples as this will begin to break down the charcoal material.

11.3 Dilution Step. After the leached samples have been removed from the hot plate and allowed to cool to room temperature, they are brought to volume with a 5 percent (v/v) solution of 0.01 N BrCl. As the leaching digest contains a substantial amount of dissolved gasses, add the BrCl slowly, especially if the samples are still warm. As before, this procedure must be performed in a properly functioning fume hood. The sample is now ready for analysis.

11.4 Hg Reduction and Purging. (Reference Section 11.2 of M1631 except that NH_2OH is not used.)

11.4.1 Bubbler System. Pipette an aliquot of the digested sample into the bubbler containing pre-blanked reagent water and a soda lime trap connected to the exhaust port. Add stannous chloride ($SnCl_2$) to reduce the aliquot and then seal the bubbler. Connect gold sample traps to the end of the soda lime trap as shown in Figures 1 and 2 of Method 1631. Finally, connect the N_2

lines and purge for 20 minutes. The sample trap can then be added into the analytical train. M1631, Section 11.2.1.

11.4.2 Flow Injection System. If required.

11.5 Desorption of Hg from the gold trap, and peak evaluation. Use Section 11.3 and 11.4 in M1631.

11.6 Instrument Calibration. Analyze the standards by AA or AF following the guidelines specified by the instrument manufacturer. Construct a calibration curve by plotting the absorbances of the standards versus µg/l Hg. The R^2 for the calibration curve should be 0.999 or better. If the curve does not have an R^2 value equal to or better than 0.999 then the curve should be rerun. If the curve still does not meet this criteria then new standards should be prepared and the instrument recalibrated. All calibration points contained in the curve must be within 10 percent of the calibration value when the calibration curve is applied to the calibration standards.

11.7 Sample Analysis. Analyze the samples in duplicate following the same procedures used for instrument calibration. From the calibration curve, determine sample Hg concentrations. To determine total

Hg mass in each sample fraction, refer to calculations in Section 15. Record all sample dilutions

11.8 Continued Calibration Performance. To verify continued calibration performance, a continuing calibration check standard should be run every 10 samples. The measured Hg concentration of the continuing calibration check standard must be within 10 percent of the expected value.

11.9 Measurement Precision. The QA/QC for the analytical portion of this method is that every sample, after it has been prepared, is to be analyzed in duplicate with every tenth sample analyzed in triplicate. These results must be within 10 percent of each other. If this is not the case, then the instrument must be recalibrated and the samples reanalyzed.

11.10 Measurement Accuracy. Following calibration, an independently prepared standard (not from same calibration stock solution) should be analyzed. In addition, after every ten samples, a known spike sample (standard addition) must be analyzed. The measured Hg content of the spiked samples must be within 10 percent of the expected value.

11.11 Independent QA/QC Checks. It is suggested that the QA/QC procedures developed for a test program include submitting, on occasion, spiked Hg samples to the analytical laboratory by either the prime contractor, if different from the laboratory, or an independent organization. The measured Hg content of reference samples must be within 15 percent of the expected value. If this limit is exceeded, corrective action (e.g., re-calibration) must be taken and the samples re-analyzed.

11.12 Quality Assurance/Quality Control. For this method, it is important that both the sampling team and analytical people be very well trained in the procedures. This is a complicated method that requires a high-level of sampling and analytical experience. For the sampling portion of the QA/QC procedure, both solution and field blanks are required. It should be noted that if high-quality reagents are used and care is taken in their preparation and in the train assembly, there should be little, if any, Hg measured in either the solution or field blanks.

11.13 Solution Blanks. Solution blanks must be taken and analyzed every time a new batch of solution is prepared. If Hg is detected in these solution blanks, the concentration is subtracted from the measured sample results. The maximum amount that can be subtracted is 10 percent of the measured result or 10 times the detection limit of the instrument which ever is lower. If the solution blanks are greater than 10 percent the data must be flagged as suspect.

11.14 Field Blanks. A field blank is performed by assembling a sample train, transporting it to the sampling location during the sampling period, and recovering it as a regular sample. These data are used to ensure that there is no contamination as a result of the sampling activities. A minimum of one field blank at each sampling location must be completed for each test site. Any Hg detected in the field blanks cannot be subtracted from the results. Whether or not the Hg detected in the field blanks is significant is determined based on the QA/QC procedures established prior to the testing. At a minimum, if field blanks exceed 30 percent of the measured value at the corresponding location, the data must be flagged as suspect.

12.0 Calculations and Data Analysis.

Use Section 12 in M1631.

13.0 Constant Proportion Sampling.

Calculate the Sample Rate/Stack Flow = “x”. “X” must be maintained within 0.75 “x” to 1.25 “x” for sampling times in excess of 12 hours. For mass emission rate calculations, use the flow CEM total measured flow corresponding to the sorbent trap sample time period.

14.0 Sampling and Data Summary Calculations.

Refer to 40 CFR part 60, appendix A, Methods 2, 4, and 5 for example calculations.

15.0 Pollution Prevention.

Refer to Section 13 in Method 1631.

16.0 Waste Management.

Refer to Section 14 in Method 1631.

17.0 Bibliography.

17.1 EPA Method 1631, Revision E “Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry,” August 2002.

17.2 “Comparison of Sampling Methods to Determine Total and Speciated Mercury in Flue Gas,” CRADA F00-038 Final Report, DOE/NETL-2001/1147, January 4, 2001.

17.3 40 CFR part 60, appendix A, “Method 29 - Determination of Metals Emissions from Stationary Sources”.

17.4 40 CFR part 60, appendix B, “Performance Specification 12A, Specification and Test Procedures for

Total Vapor Phase Mercury Continuous Emission Monitoring Systems in Stationary Sources”.

17.5 ASTM Method 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)”.