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## **PERFORMANCE SPECIFICATION 4—SPECIFICATIONS AND TEST PROCEDURES FOR CARBON MONOXIDE CONTINUOUS EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES**

### *1.0 Scope and Application*

#### 1.1 Analytes.

<b>Analyte</b>	<b>CAS No.</b>
Carbon Monoxide (CO)	630-08-0

#### 1.2 Applicability.

1.2.1 This specification is for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of installation or soon after and whenever specified in an applicable subpart of the regulations. This specification was developed primarily for CEMS having span values of 1,000 ppmv CO.

1.2.2 This specification is not designed to evaluate the installed CEMS performance over an extended period of time nor does it identify specific calibration techniques and other auxiliary procedures to assess CEMS performance. The source owner or operator, is responsible to calibrate, maintain, and operate the CEMS. The Administrator may require, under section 114 of the Act, the source owner or operator to conduct CEMS performance evaluations at other times besides the initial test to evaluate the CEMS performance. See 40 CFR part 60, section 60.13(c).

1.2.3 The definitions, performance specification test procedures, calculations, and data analysis procedures for determining calibration drift (CD) and relative accuracy (RA) of Performance Specification 2 (PS 2), sections 3, 8.0, and 12, respectively, apply to this specification.

### *2.0 Summary of Performance Specification*

The CD and RA tests are conducted to determine conformance of the CEMS to the specification.

### *3.0 Definitions*

Same as in section 3.0 of PS 2.

### *4.0 Interferences [Reserved]*

### *5.0 Safety*

This performance specification may involve hazardous materials, operations, and equipment. This performance specification may not address all of the safety problems associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing this performance specification. The CEMS users manual should be consulted for specific precautions to be taken with regard to the analytical procedures.

#### *6.0 Equipment and Supplies*

Same as section 6.0 of PS 2.

#### *7.0 Reagents and Standards*

Same as section 7.0 of PS 2.

#### *8.0 Sample Collection, Preservation, Storage, and Transport*

8.1 Relative Accuracy Test Procedure. Sampling Strategy for reference method (RM) Tests, Number of RM Tests, and Correlation of RM and CEMS Data are the same as PS 2, sections 8.4.3, 8.4.4, and 8.4.5, respectively.

8.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulation, Method 10, 10A, 10B or other approved alternative are the RM for this PS.

#### *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 for specific analytical procedures.

#### *12.0 Calculations and Data Analysis*

Same as section 12.0 of PS 2.

#### *13.0 Method Performance*

13.1 Calibration Drift. The CEMS calibration must not drift or deviate from the reference value of the calibration gas, gas cell, or optical filter by more than 5 percent of the established span value for 6 out of 7 test days (*e.g.*, the established span value is 1000 ppm for Subpart J affected facilities).

13.2 Relative Accuracy. The RA of the CEMS must be no greater than 10 percent when the average RM value is used to calculate RA or 5 percent when the applicable emission standard is used to calculate RA.

*14.0 Pollution Prevention [Reserved]*

*15.0 Waste Management [Reserved]*

*16.0 Alternative Procedures [Reserved]*

*17.0 References*

1. Ferguson, B.B., R.E. Lester, and W.J. Mitchell. Field Evaluation of Carbon Monoxide and Hydrogen Sulfide Continuous Emission Monitors at an Oil Refinery. U.S. Environmental Protection Agency. Research Triangle Park, N.C. Publication No. EPA-600/4-82-054. August 1982. 100 p.
2. “Gaseous Continuous Emission Monitoring Systems—Performance Specification Guidelines for SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, O<sub>2</sub>, and TRS.” EPA-450/3-82-026. U.S. Environmental Protection Agency, Technical Support Division (MD-19), Research Triangle Park, NC 27711.
3. Repp, M. Evaluation of Continuous Monitors for Carbon Monoxide in Stationary Sources. U.S. Environmental Protection Agency. Research Triangle Park, N.C. Publication No. EPA-600/2-77-063. March 1977. 155 p.
4. Smith, F., D.E. Wagoner, and R.P. Donovan. Guidelines for Development of a Quality Assurance Program: Volume VIII—Determination of CO Emissions from Stationary Sources by NDIR Spectrometry. U.S. Environmental Protection Agency. Research Triangle Park, N.C. Publication No. EPA-650/4-74-005-h. February 1975. 96 p.

*18.0 Tables, Diagrams, Flowcharts, and Validation Data*

Same as section 18.0 of PS 2.