

Question 15.5

Topic: Testing Requirements for Add-on SO₂ and NO_x Emission Control Installations

Question: When add-on SO₂ or NO_x emission controls (e.g., flue gas desulfurization (FGD) systems, selective catalytic reduction (SCR, SNCR), etc.) are installed on affected units, what are the CEMS testing requirements?

Answer: Section 75.20(b) describes various changes (e.g., changes to a continuous emission monitoring system (CEMS), to the manner of unit operation, to the flue gas handling system, etc.) that may require recertification. For example, relocation of a CEMS sampling probe¹ or replacement of an analyzer requires recertification. Modifications to a CEMS may require recertification if the changes "significantly affect" the ability of the CEMS to accurately measure and record emissions. And changes to the manner of unit operation or to the flue gas handling system may require recertification if the changes "significantly" alter the flow or concentration profile.

Changes such as these sometimes accompany the installation of add-on SO₂ and NO_x emission controls. Therefore, installing an add-on control device may, in some cases, require recertification of existing monitoring systems. However, in other cases, depending on the scope of the project, initial certification of new monitoring systems may be required, or perhaps diagnostic testing may be sufficient.

Below are guidelines that explain, in accordance with § 75.20(b), under what circumstances recertification is required and when diagnostic testing is sufficient.

Certification or Recertification Requirements

The following describes those circumstances under which a monitoring system must be recertified (or initially certified) upon installation of add-on SO₂ or add-on NO_x emission controls.

- (1) If installation of the add-on controls involves any of the changes listed in §75.20(b) that require recertification, the full battery of tests listed in §75.20(c) must be performed to recertify the CEMS in question².
- (2) If installation of the add-on controls involves installing new CEMS at a new stack, the full battery of tests listed in §75.20(c) must be performed for initial certification of the CEMS in question.
- (3) For existing dilution-extractive CEMS, if the nominal size of the critical orifice is changed (i.e., if the dilution ratio changes) when add-on emission controls are installed, a full battery of tests described in §75.20(c) is required¹ for recertification of the gas monitoring systems (i.e., SO₂, NO_x, and CO₂, as applicable).
- (4) In cases where installation of the add-on controls triggers a dual-span

requirement under Section 2.1.1.4 or 2.1.2.4 of Appendix A to Part 75, if the added low-scale SO₂ or NO_x measurement range is on a different analyzer from the existing high-scale range, and if the low-scale and high-scale analyzers are not connected to a common probe and sample interface, the high and low scales are considered to be separate monitoring systems and a full battery of certification tests of the low scale monitoring system is required. That is, you must perform a linearity check (unless exempted under Section 6.2 of Appendix A), a 7-day calibration error test (unless exempted under Section 6.3.1 of Appendix A), a normal load RATA, a bias test, and a cycle time test.

All required certification or recertification tests must be completed no later than 90 unit operating days or 180 calendar days (whichever occurs first) after reagent is first injected into the add-on control device (see Question 15.4) or, in some cases no later than 90 unit operating days or 180 calendar days (whichever occurs first) after gases first exit to the atmosphere through a new stack (see Question 15.7). The conditional data validation provisions of §75.20(b)(3) may be used for the entire 90 operating/180 calendar day window, if necessary. Submit a certification or recertification application (as applicable) in accordance with §75.63(a)(1) or (a)(2), no later than 45 days after completing all required tests. Use the ECMPS Client Tool to submit the results of the certification or recertification tests electronically. Be sure to include a <QACertificationEventData> record(s), describing the event(s), the tests performed, and (if applicable), the use of conditionally valid data.

Diagnostic Testing – Add-on SO₂ Control Installations

When add-on SO₂ controls are installed, perform the following diagnostic testing on all monitoring systems that are not required to be initially certified or recertified:³

(1) If Part 75 requires a low-scale measurement range to be added to the SO₂ analyzer⁴, no additional tests are required for the high range. Quality-assure the low range as follows. Perform:

- _ A diagnostic linearity check (if the span value is _ 30 ppm);
- _ A diagnostic 7-day calibration error test; and
- _ A diagnostic normal load RATA. ⁵

(2) To quality assure the existing NO_x and CO₂ monitoring systems, perform a 12-point stratification check for NO_x, and CO₂ at the CEMS or reference method sampling location⁶, in accordance with Section 6.5.6.1 of Appendix A to Part 75, with the SO₂ controls operating normally.⁷

If the results of the stratification test show the absence of significant stratification for NO_x and CO₂, consistent with the criteria in Section 6.5.6.3(a) of Appendix A, no additional tests are required for the

existing NO_x monitoring system, or the existing CO₂ monitoring system.

If a lack of significant stratification cannot be demonstrated for NO_x or CO₂, perform a diagnostic normal load RATA of:

- _ The NO_x-diluent CEMS if either NO_x or CO₂ is stratified⁶; and
- _ The CO₂ CEMS if CO₂ is stratified⁶.

(3) To quality-assure the existing flow monitor, perform:

- _ A diagnostic 3-load flow RATA.

(4) To quality-assure an existing moisture monitoring system (if applicable), perform a diagnostic normal-load RATA.

All required diagnostic testing must be completed no later than 90 unit operating days or 180 calendar days (whichever occurs first) after the first unit operating hour in which reagent is first injected with the unit in operation. The conditional data validation provisions of §75.20(b)(3) may be used for the entire 90 operating/180 calendar day window, if necessary. Submit the results of the required diagnostic tests electronically, using the ECMPS Client Tool. Be sure to include a <QACertificationEventData> record describing the control device installation, the tests performed, and (if applicable), the use of conditionally valid data.

Diagnostic Testing -- Add-on NO_x Control Installations

When add-on NO_x controls are installed, perform the following diagnostic testing on all existing monitoring systems that are not required to be initially certified or recertified:⁸

(1) With the possible exception of the project described in (6), below, no additional tests of the high-scale NO_x measurement range are required.

(2) If Part 75 requires a low measurement scale to be added to the NO_x analyzer⁹, quality-assure the low range as follows. Perform:

- _ A diagnostic linearity check¹⁰;
- _ A diagnostic 7-day calibration error test¹¹; and
- _ A diagnostic normal load NO_x RATA with the add-on controls operating, if either:

-- The add-on NO_x controls will be operated year-round rather than seasonally; or

-- The high and low ranges are not connected to a common probe and sample interface.

If the add-on controls will be operated seasonally, EPA strongly

recommends that a diagnostic RATA be performed with the add-on controls in normal operation prior to use of the low scale for any seasonal compliance program, even if the high and low ranges are connected to a common sample probe and interface.¹²

(3) No tests are required to quality assure existing SO₂ and CO₂ monitoring systems that are dilution-extractive.¹³

(4) To quality assure existing SO₂ and CO₂ monitoring systems that are not dilution extractive, perform:

- _ Diagnostic normal-load RATAs.¹⁴

(5) To quality assure the existing stack flow monitoring system, perform:

- _ An abbreviated diagnostic flow-to-load test, as described in Section 2.2.5.3 of Appendix B.

If the test is passed, no further testing of the flow monitor is required.

If the test is failed, perform:

- _ A diagnostic flow RATA. This RATA may be a single-load test at normal load, provided that the flow monitor polynomial coefficients and/or K-factors are not reset or adjusted. If the polynomial coefficients and/or K-factors are adjusted, a diagnostic 3-load RATA is required.

(6) For common stack configurations, if NO_x emission controls are added to the individual units in stages (e.g., an SCR is added to Unit 1 this spring and a second SCR is added to Unit 2 next fall)¹⁵, perform:

- ☐ A 12-point stratification test after each control device addition, in accordance with section 6.5.6.1 of Appendix A, to evaluate whether NO_x stratification has been introduced by the differences in the concentrations of the gas streams entering the stack.
- ☐ If the results of the test suggest that addition of the SCR has introduced stratification, then, consistent with §75.20(b), perform a diagnostic normal load RATA of the NO_x monitoring system.

(7) No additional tests are required to quality assure an existing moisture monitoring system.

All required diagnostic testing must be completed no later than 90 unit operating days or 180 calendar days (whichever occurs first) after the first injection of reagent into the add-on NO_x controls. The conditional data validation provisions of §75.20(b)(3) may be used for the entire 90 operating/180 calendar day window, if necessary. Submit the results of the required diagnostic tests electronically, using the ECMPS Client Tool. Be sure to include a <QACertificationEventData> record describing the control device installation, the tests performed, and (if applicable), the use of conditionally valid data.

Diagnostic Testing – Installation of Both SO₂ and NO_x Controls

If a project involves installation of both SO₂ and NO_x add-on emission controls, the CEMS certification, recertification, or diagnostic testing that must be performed is determined by comparing the testing requirements for the individual control device installations. In all cases, you must implement the most stringent requirements. For example, if a particular test of a monitor is required by the SO₂ control device installation but not by the NO_x control device installation, the former requirement is more stringent than the latter; therefore, the test must be performed.

References: § 75.4(e), §§ 75.20(b) and (c), § 75.63(a), Appendix A, Sections 2.1.1.4, 2.1.2.4 and 6.5(c), Appendix B, Section 2.2.5.3

History: First published in October 2003 Revised Manual; Revised in the 2013 Manual

Note: The provisions of this question apply prospectively, from the date of its original publication in the Part 75 Emissions Monitoring Policy Manual (i.e., October 2003), as Question 16.15. That is, the policy provisions apply only to add-on control device installations for which the allotted window of time to complete the required CEMS testing begins (as described in Question 15.4) on or after the original October 2003 publication date. Control device installations that pre-date this question are "grandfathered."