

Requirements for Continuous Emission Monitoring Systems

Proposed Amended Rules (PAR) 218 and 218.1

Proposed Rules (PR) 218.2 and 218.3

Working Group Meeting #10

October 6, 2020 1:00 pm

Join Zoom Meeting

<https://scaqmd.zoom.us/j/96401722130?pwd=UHhtNXBQZk00YXg0L0tNYjBFT2grUT09>

Meeting ID: 964 0172 2130

Password: 368566

Agenda

- Comments on PR 218.2 Preliminary Draft Rule
- PR 218.3 Rule Structure
- PR 218.3 Preliminary Draft Rule Overview
 - Subdivisions (a) through (g)
- Next Steps

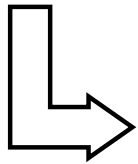
PR 218.2
Comments and Responses

Comment on PR 218.2 (e)(4) – Demonstrate Unit Non-Operation

Draft Rule Language

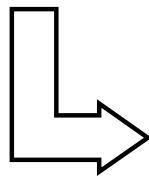
218.2(e)(4)(A)(i)

Disconnect the fuel line to the unit and place flanges at both ends of the fuel line



Concern

- Does “place flanges at both end” mean one flange near the unit and the other flange near the main line?
- A flange near the main line could block fuel flow to other units of the same fuel line



Response

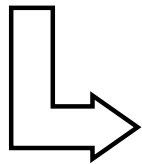
- This requirement is not intended to block the fuel flow at two different points of the fuel line
- The rule language is modified as following:
 - “*Disconnect the fuel line to the unit and place blind flange(s) to prevent fuel flow*”

Comment on PR 218.2 (e)(4) – Demonstrate Unit Non-Operation

Draft Rule Language

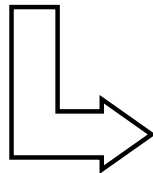
218.2(e)(4)(A)(iv)

Demonstrate the unit is not operational based on a stack flow monitoring system certified according to subdivision (f) or any other monitoring system that is approved by the Executive Officer



Concern

- Criteria should be defined for “any other monitoring system that is approved by the Executive Officer”



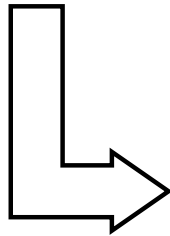
Response

- Rule language modified as following:
“Demonstrate the unit is not operational based on a stack flow monitoring system certified according to subdivision (f) or any other monitoring system that can be confirmed by a South Coast AQMD test method and is approved by the Executive Officer”

Comment on PR 218.2 (f)(3) - CEMS Application Form

Question

When does the ST - 220 CEMS application form need to be submitted by?



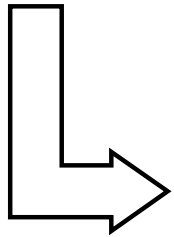
Response

- The application process is sequential with the following steps:
 1. Submit ST-220
 2. Obtain initial approval (application material complete)
 3. Conduct CEMS installation or modification
 4. Conduct certification test
 5. Obtain final approval
- The initial approval takes up to 60 days once ST-220 is received (if information is complete) as specified in the rule
- The owner or operator will be able to determine when to submit the application

Comment on PR 218.2 (f)(6) – Final Approval

Concern

As there is no time limit for the final approval, if the CEMS application would be disapproved, more data would be retroactively invalidated if the process is delayed.



Response

Staff is proposing that within 60 days upon receiving all the required certification tests, the Executive Officer shall provide a timeframe of the final approval to the owner or operator of the CEMS

PR 218.2 (f)(6) – Final Approval

(6) Final Approval

- (A) The Executive Officer will issue a CEMS final certification letter as the final approval, if the information in the application form and the certification test reports are determined to meet the requirements specified in Rule 218.3 subdivisions (e) and (f).
- (B) The owner or operator of the CEMS shall be notified of the expected issuance date of the CEMS final certification letter by the Executive Officer within 60 days of receiving the certification test report(s) specified in paragraph (f)(5).
- (C) The owner or operator of the CEMS shall be notified of a new issuance date of the CEMS final certification letter by the Executive Officer if additional data and/or test(s) are required prior to final approval. This new issuance date will be determined by the Executive officer within 60 days of receiving the additional data and/or test(s).

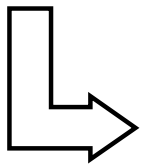
- Revised since last meeting
- Addresses the concern of delayed final approval

Comment on PR 218.2 (f)(7) – Modification of CEMS Component Listed in Guidance Document R-002

Draft Rule Language

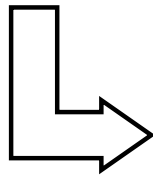
218.2(f)(7)(C):

Submit the test reports to the Executive Office within 30 days after completing the tests



Request

Change the test report submittal due date to 60 days instead of 30 days after completing the tests



Response

Staff accepts the recommendation for 60 days on submitting the test reports

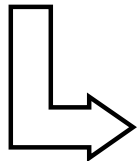
Comment on PR 218.2 (f)(9) – CEMS Modification

Draft Rule Language

218.2(f)(9):

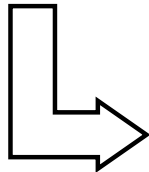
Modification of CEMS Component Listed in Quality Assurance/Quality Control Plan (but not identified on the CEMS final certification letter or listed in the South Coast AQMD Technical Guidance Document R-002)

- Obtain a written approval from the Executive Officer prior to the modification
- (Other requirements)



Concern

For modifications that are minor, and sometimes need a quick turn-around time, requiring a written approval prior to the modification would be either unnecessary or adversely impact the CEMS operation



Response

- Staff has revised the rule language (See next slide)

218.2 (f)(9) – Modification of CEMS Component Listed in QA/QC Plan

(9) Modification of CEMS Component Listed in Quality Assurance/Quality Control Plan

For a CEMS modification on a component that is not identified on the CEMS final certification letter or listed in the South Coast AQMD Technical Guidance Document R-002, but is listed in the Quality Assurance/Quality Control Plan, the owner or operator of the CEMS shall:

- (A) Provide a written notification to the Executive Officer prior to the modification that includes the date and description of the planned CEMS modification;
- (B) Submit a modified Quality Assurance/Quality Control Plan to the Executive officer within 30 days of notification; and
- (C) Subject to any testing requirement and/or further assessment instructed by the Executive Officer if the modification is deemed to affect the reliability, precision, or accuracy of the CEMS.

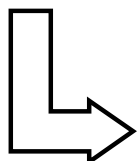
- Revised since last meeting
- Not requiring a written approval prior to the modification
- Requiring a written notification
- The Executive Office has a opportunity to determine if additional testing or assessment should be required

Comment on PR 218.2 (f)(10) – Emission Data During the Certification Process

Draft Rule Language

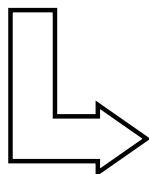
218.2(f)(10):

“...all the emission data measured and recorded by the CEMS shall be considered valid quality assured data, beginning at the hour of completing all the required certification tests pursuant to paragraph (f)(5).”



Concern

- A considerable amount of data loss would occur during the certification testing period (estimating 14 days)
- Suggestion to conditionally consider the data recorded during the certification testing period as valid as well



Response

- Staff has revised the rule language (See next slide)

PR 218.2 (f)(10) – Emission Data During the Certification Process

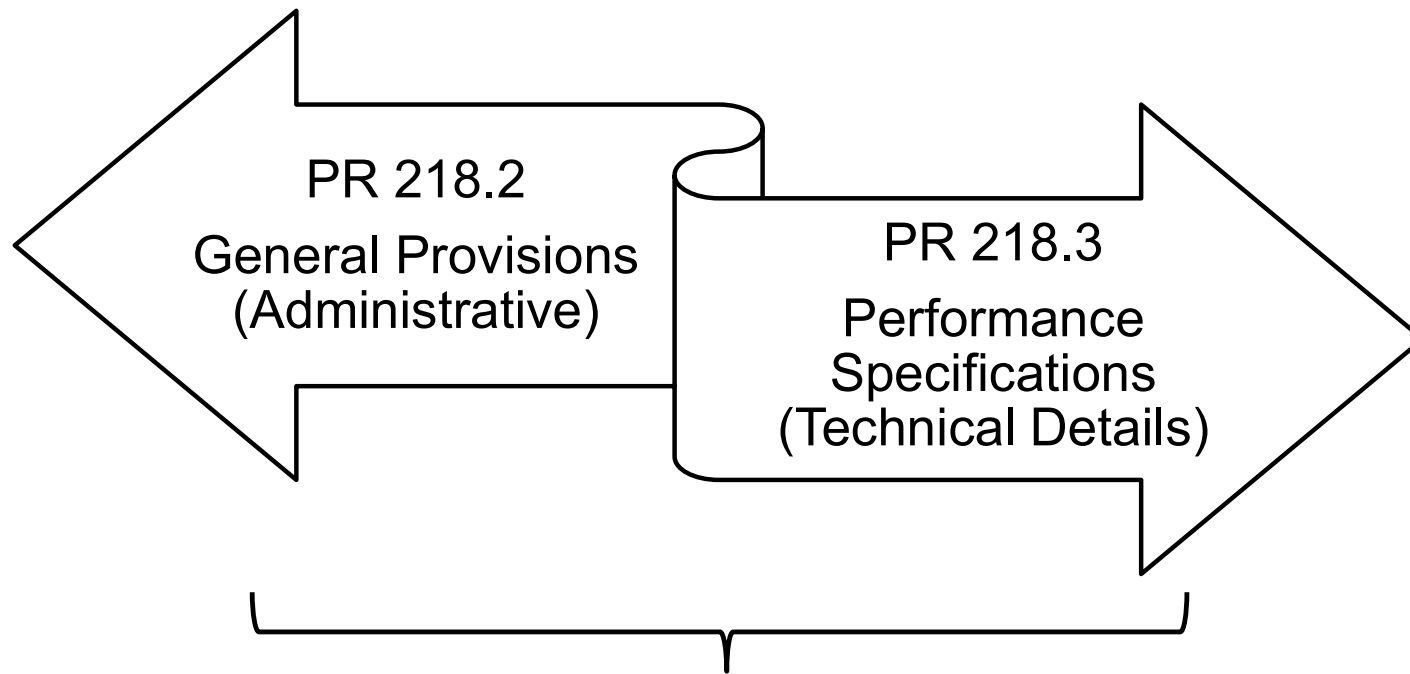
(10) Emission Data During CEMS Certification or Recertification

- (A) Upon completion of a successful calibration error test pursuant to Rule 218.3 subparagraphs (f)(1)(B) and (f)(1)(C) and prior to the Executive Officer's approval of final CEMS certification or recertification, all the emission data measured and recorded by the CEMS shall be considered valid quality assured data, beginning at the hour of passing the calibration error test. The calibration error test for this purpose must be passed before any of the required certification tests pursuant to paragraph (f)(5) are commenced but no more than 14 days prior to the completion of all the required certification tests.
- (B) If the Executive Officer disapproves the final CEMS certification or recertification, the valid emission data pursuant to subparagraph (f)(10)(A) shall be retroactively considered invalid data that shall not be utilized for compliance demonstration or considered as available for CEMS data availability calculation, until the hour of the next time completing all the required certification tests pursuant to paragraph (f)(5).

- Revised since last meeting
- Align with the Part 75 requirement on valid emission data during recertification test period
- Minimize data loss during the certification process

218.3 Rule Structures

How Are PR 218.2 and PR 218.3 Related?



Both rules reference each other

Rule Structure - PR 218.3

To be presented at this Working Group meeting (WG #10)

- (a) Purpose
- (b) Applicability
- (c) Definitions
- (d) Implementation Schedule
- (e) Pre-Certification Requirements
- (f) Certification Test Requirements and Specifications
- (g) Quality Assurance Testing Requirements and Specifications
- (h) Calibration Gas and Zero Gas
- (i) Data Handling
- (j) SCEMS Requirements
- (k) Moisture Correction
- (l) Exemption
- Tables and Attachments (e.g., Equations)

- CEMS location
- Sampling location
- Full Span Range
- Data Acquisition and Handling System (DAHS)

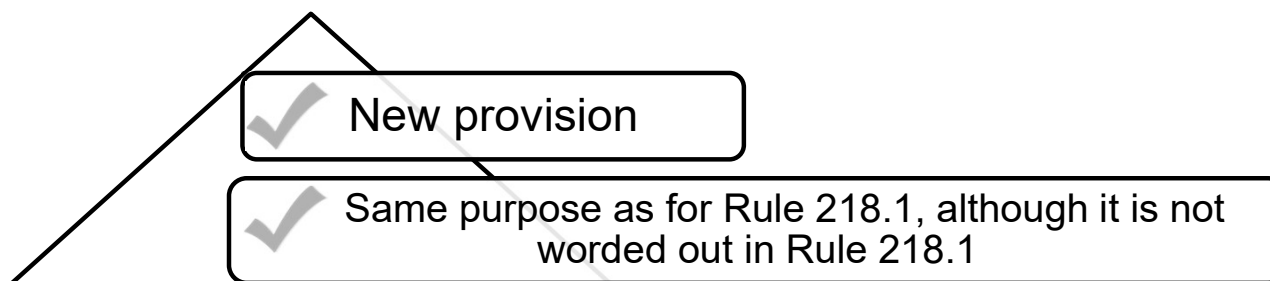
- Data points below 10% of span
- Data points above 95% of span
- Emission data averaging
- Data availability
- Out-of-control period and alternative data acquisition
- Semi Continuous Emission Monitoring System (SCEMS)

PR 218.3 – Performance Specifications

PR 218.3 (a)

Purpose of the Rule

(a)	<p>Purpose The purpose of Rule 218.3 is to establish performance specifications on certification and quality assurance and quality control program for Continuous Emission Monitoring Systems (CEMS), Alternative Continuous Emission Monitoring System (ACEMS), and Semi-Continuous Emission Monitoring System (SCEMS). Unless otherwise specified, the owner or operator of the CEMS, ACEMS, or SCEMS is responsible for compliance with the requirements specified in this rule.</p>
-----	--



Subdivisions (b) and (d) Applicability and Implementation Schedule

PR 218.3

(b): Applicability

(d): Implementation Schedule

“Implementation
Schedule” was
provided in the last
Working Group
meeting for PR
218.2

PR 218.2
(b) and (d)

Two Subdivisions:
✓ Under both rules
✓ Identical in Both Rules

PR 218.3
(b) and (d)

PR 218.3(c) - Definitions

PR 218.3

Table 1: Changes to definitions as compared to Rule 218.1

	Definitions	Notes
Removing Existing Definitions	<ul style="list-style-type: none"> • CALIBRATION CHECK • CEMS AVAILABILITY PERCENTAGE • CERTIFIED GAS MIXTURE • CONTINUOUS MONITORING • FULL SPAN RANGE • MODIFICATION REQUIRING RECERTIFICATION • OPERATIONAL PERIOD • RELATIVE ACCURACY AUDIT (RAA) • ROUTINE MAINTENANCE • SYSTEM FAILURE • ZERO CHECK 	Definitions removed: <ul style="list-style-type: none"> • No longer used in the rule; or • Terminology and definition integrated in the proposed rule
Adding New Definitions	<ul style="list-style-type: none"> • ACEMS • CEMS MODIFICATION • FORMER RECLAIM FACILITY • LOWEST VENDOR GUARANTEED SPAN RANGE • MAINTENANCE • RECLAIM • RECLAIM FACILITY • SPAN RANGE • UPPER SPAN VALUE • UNIT 	Definitions added: <ul style="list-style-type: none"> • New terminologies used in proposed rule; or • Additional clarification needed
Revising Existing Definitions	A number of definitions; Examples are definitions for DILUENT GAS and RELATIVE ACCURACY TEST AUDIT.	<ul style="list-style-type: none"> • Provides clarity • Equations from certain definitions are incorporated in Table 3

PR 218.3(c) New Definitions

PR 218.3

- ACEMS
- CEMS MODIFICATION
- UNIT

⇒ Same definitions as in PR 218.2

- SPAN RANGE
- UPPER SPAN VALUE

⇒ Will be explained under the discussion for Span Range Requirements - PR 218.3 (e)(3)

- RECLAIM
- RECLAIM FACILITY
- FORMER RECLAIM FACILITY

⇒ Same definitions as in Rule 1100

- LOWEST VENDOR GUARANTEED SPAN RANGE
- MAINTENANCE

⇒ Discussed in the following slides

PR 218.3(c)(15)

Definition for “LOWEST VENDOR GUARANTEED SPAN RANGE”

- (15) **LOWEST VENDOR GUARANTEED SPAN RANGE** means the lowest span range that the vendor guarantees to be capable of meeting all current certification requirements of Rules 218.2 and 218.3, as applicable.

- Clarification to the existing terminology

PR 218.3(c)(16) Definition for “MAINTENANCE”

- (16) MAINTENANCE means the preventive evaluation and adjustment (if necessary) of CEMS performed at specified intervals to preclude system failure. Maintenance may be performed as recommended by the manufacturer or a documented standard operating procedure determined through operating experience and approved by the Executive Officer. Repairs to a malfunctioning system are excluded from this definition.

- Based on the definition for “ROUTINE MAINTENANCE”
- “MAINTENANCE”, instead of “ROUTINE MAINTENANCE”, is the term used in the rule

Pre-certification Requirements – System Settings Prior to Certification Testing

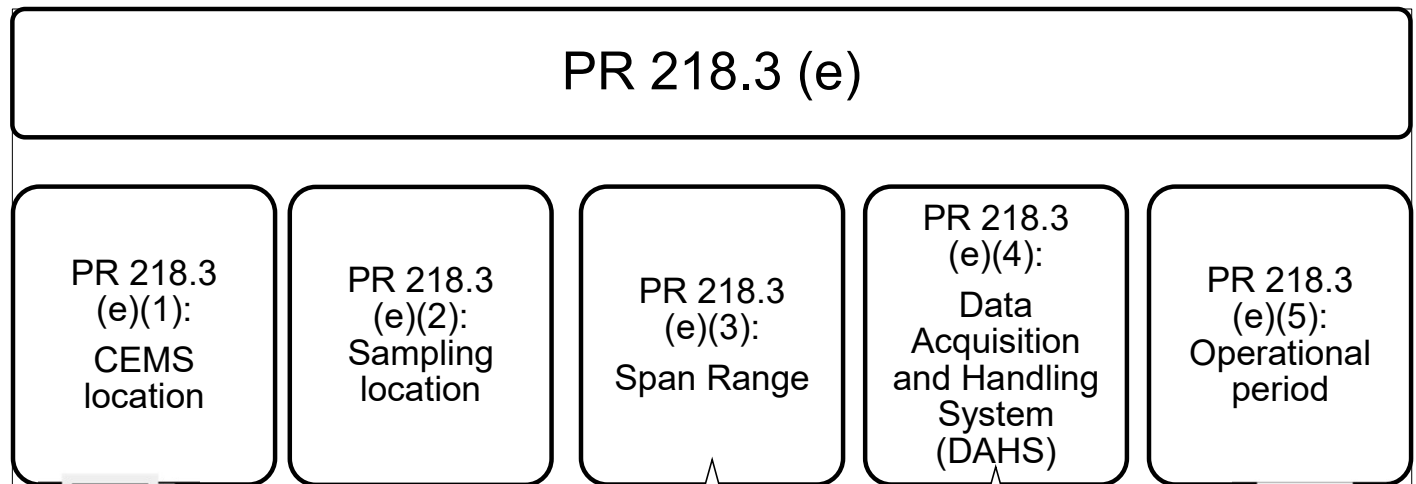
PR 218.3

Comparing Rules by Provisions

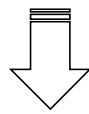
218.1*	218.3
(b)(1)(A)	(e)(1)
(b)(1)(B)	(e)(2)
(b)(1)(C)	(e)(3)
(b)(1)(E)	(e)(4)
(b)(1)(F)	(e)(5)



*218 (b)(1)(D) for Strip Chart Recorder is removed



Minor change on wording



Structured the rule language



New provisions included



New provisions included



Minor change on wording (“before” to “prior to”)

PR 218.3 (e)(1) – CEMS Location

No Requirement change
Example #1

218.1 (b)(1)(A)	218.3 (e)(1)	Changes
<p>The CEMS shall be installed at a location that enables measurements of <u>air contaminant</u> and diluent gas concentration, and flow rates <u>can be made which</u> are representative of the stack emissions of the source</p>	<p>The CEMS shall be installed at a location that enables measurements of <u>air pollutant</u> and diluent gas concentration, and flow rates are representative of the stack emissions of the unit.</p>	<p>✓ Minor terminology and sentence changes for consistency and conciseness</p>

No Requirement change
Example #2

PR (e)(5) – Sampling Location

PR 218.3

218.1 (b)(1)(B)	218.3 (e)(2)	Changes
<p>The monitoring system sampling probe tip and the reference method sampling port locations shall be determined according to District Method 1.1. The monitoring sampling probe shall be located where a sample may be obtained which is representative of the source emissions. Each probe shall not interfere with the other when in use. Other locations may be chosen subject to a written approval of the Executive Officer. If an alternate location is chosen which does not conform with District Method 1.1, the absence of flow disturbance shall be demonstrated using the District method in the source Test Manual, Chapter X, Section 1.4 - "Alternative Site Selection Method", or 40 CFR, Part 60, Appendix A, Method 1, Section 2.5 - "Alternative Measurement Site Selection Procedure", and, the absence of stratification shall be demonstrated using the District method in the source Test Manual, Chapter X, Section 13 - "Determination of Gaseous Constituent Stratification". Alternatives to sampling site selection in the presence of stratification are presented in Rule 218.1(b)(3)(C)(ii).</p>	<p>(A) The monitoring system sampling probe tip and the reference method sampling port locations shall be determined according to the South Coast AQMD Method 1.1.</p> <p>(B) The monitoring sampling probe shall be located where the sample obtained is representative of emissions.</p> <p>(C) Each probe shall not interfere with any other probe when in use.</p> <p>(D) The owner or operator may choose other sample locations subject to a written approval of the Executive Officer.</p> <p>(E) If an alternate location is chosen as allowed in subparagraph (e)(2)(D) which does not conform with the South Coast AQMD Method 1.1:</p> <ul style="list-style-type: none"> (i) The absence of cyclonic flow shall be demonstrated using the South Coast AQMD method 1.1, Section 2.4 in the Test Manual, Chapter X, Section 1.4 - "Alternative Site Selection Method", or 40 CFR, Part 60, Appendix A, Method 1, Section 11.4 – "Verification of Absence of Cyclonic Flow"; and (ii) The absence of stratification shall be demonstrated using the South Coast AQMD method in the Test Manual, Chapter X, Section 13 - "Determination of Gaseous Constituent Stratification"; or (iii) In the presence of stratification, alternatives to sampling site selection shall comply with the requirements specified in Attachment B section (C) 	<p>✓ Structured the rule language for better comprehension</p>

PR 218.3 (e)(3) - Span Range

Terminology Change

FULL SPAN RANGE

- FULL SPAN RANGE means the full range of values or data display output that a monitor component is certified to measure.

SPAN RANGE

- SPAN RANGE means the full range that is 0% to 100% of the data display output that a monitor component has been calibrated to measure.

UPPER SPAN VALUE

- UPPER SPAN VALUE means the upper range values of a span range that is 100% of the data display output that a monitor component has been calibrated to measure.

For clarification:


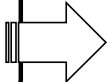




- Replaced the term “Full Span Range” by “Span Range” through the proposed rule, with no change on the meaning
- Added the definition for “Upper Span Value” to specify the upper range value of a span range

PR 218.3 (e)(3) How to Set the Span Range for an Analyzer

PR 218.3

PR 218.3 (e)(3): Span Range

218.1	218.3
(b)(1)(C)(i)	(e)(3)(A)
(b)(1)(C)(ii)	(e)(3)(B)
None	(e)(3)(C)
None	(e)(3)(D)
None	(e)(3)(E)
(b)(1)(C)(iv)	(e)(3)(A)

- (e)(3)(A): Data points within 10 to 95 percent of the upper span value  Wording change
- (e)(3)(B): Upper span value set between 150 and 200 percent of the concentration limit  Structure change
- (e)(3)(C): In lieu of (e)(3)(A), may approve a span range such that data points fall at or below 10 percent of the upper span value  New provisions
- (e)(3)(D): Span range for unit with emission limit less than 5 ppm may be approved  New provisions
- (e)(3)(E): The top span range of a multiple span range analyzer is exempted from span range requirements  New provisions
- (e)(3)(F): Diluent monitor span range  No change

PR 218.3 (e)(3)(A) – Data Points Within 10 to 95 Percent of the Span Range

218.1 (b)(1)(C)(i)	218.3 (e)(3)(A)	Changes
<p>The <u>FSR</u> for <u>mass emission rate</u>, <u>air contaminant</u>, <u>diluent</u> and <u>flow analyzers</u> shall be set such that all data points are within 10 to 95 percent of the <u>range</u>.</p>	<p>The <u>span range</u> for <u>air pollutant</u> and <u>diluent analyzers</u> shall be set such that all data points are within 10 to 95 percent of the <u>upper span value under normal operating conditions for the unit</u>.</p>	<ul style="list-style-type: none"> ✓ Changed term “FSR” (full span range) to “span range” throughout the rule with no change on the intended meaning ✓ Removed “mass emission rate” and “flow analyzers” ✓ Changed “air contaminant” to “air pollutant” ✓ Changed “range” to “upper span value” to avoid confusion ✓ Added “under normal operating conditions for the unit”

PR 218.3 (e)(3)(C)

Span Range Setting When Normal Emission Level is Significantly Lower Than the Emission Limit

- (C) If the owner or operator of the CEMS cannot meet both requirements specified in subparagraphs (e)(3)(A) and (e)(3)(B), the owner or operator of the CEMS shall be exempt from subparagraph (e)(3)(A), provided that the air pollutant analyzer is set at a span range approved by the Executive Officer that allows data points to fall at or below 10 percent of the upper span value.

- ✓ This provision will address situations when the actual emissions are significantly lower than the applicable emission limit (likely applicable to CO emissions)
- ✓ Under these conditions data accuracy must still be sufficient for compliance demonstration

An Example When PR 218.3 (e)(3)(c) Would be Referenced for Setting a Span Range

Example

Unit concentration limit: 400 ppm;
Unit emission concentration at normal operation: 30 ppm

To comply with (e)(3)(A): data points with 10 – 95% of upper span value

To comply with (e)(3)(B): Span value between 150 to 200% of the unit concentration limit, no lower than 120% upon approval

(e)(3)(C)

- Approved span range;
- Allowing data points at or below 10 percent of the span value;
- Exempt from (e)(3)(A)
- Comply with (e)(3)(B)

Span value may be set at a value between 32 ppm and 300 ppm

Span value may be set at a value between 480 ppm and 800 ppm

Cannot meet both the requirements specified in (e)(3)(A) and (e)(3)(B)

✓ The approved span value could be a value between 480 ppm and 800 ppm

PR 218.3 (e)(3)(D)

Full Span Range Setting for CEMS Monitoring a Unit With
Low Emission Limit

(D) If an air pollutant analyzer monitors a unit with the concentration limit less than 5 ppm, the owner or operator of the CEMS shall be exempt from subparagraph (e)(3)(B), and the air pollutant analyzer shall be set at a span range approved by the Executive Officer, provided that the approved upper span value for the analyzer is not higher than 10 ppm.

- ✓ This proposal is for unit with emission limit at or below 5 ppm
- ✓ The approved FSR are not higher than 10 ppm
- ✓ Example: a turbine with emission limit at 2 or 2.5 ppm can have the CEMS FSR set up to 10 ppm

PR 218.3 (e)(3)(E)

For a CEMS Analyzer With Multiple Span Ranges

- (E) The owner or operator of a CEMS analyzer with multiple span ranges shall set the span ranges for this analyzer pursuant to subparagraphs (e)(3)(A) through (e)(3)(D), for each span range or the combined span ranges, except for:
- (i) The higher span range of a dual range analyzer; or
 - (ii) The highest span range of an analyzer with more than two span ranges.








- ✓ The highest span range (or the higher span range for a dual range analyzer) is exempt from the specifications
- ✓ This is a new rule provision but an existing concept applied in practice

PR 218.3 (e)(4) The Requirements for the Data Acquisition and Handling System (DAHS)

PR 218.3

PR 218.3 (e)(4):
Data Acquisition and Handling System (DAHS)
(previous named as Data Acquisition System (DAS))

218.1	218.3
(b)(1)(E)(ii)	(e)(4)(A)
(b)(1)(E)(iii)	(e)(4)(B)
(b)(1)(E)(iv)	(e)(4)(C)
(b)(1)(E)(vi)	(e)(4)(D)
None	(e)(4)(E)
(b)(1)(E)(v)	(e)(4)(F)
None	(e)(4)(G)

- (e)(4)(A): Record data at least once every minute  No change
- (e)(4)(B): For SCEMS, record data at least once every 15 minutes  No change
- (e)(4)(C): Constant data acquisition rate  No change
- (e)(4)(D): Same sample acquisition rate during certification, RATA(s), and normal operation  No change
- (e)(4)(E): Record all status code specified in Table 2  New provision
- (e)(4)(F): Use all valid data points for compliance determination  No change
- (e)(4)(G): Incorporate all applicable data handing requirements specified in subdivision (i)  New provision

PR 218.3 (e)(4) The Requirements for the Data Acquisition and Handling System (DAHS)

- (4) The Data Acquisition and Handling System (DAHS) of the CEMS shall meet the following requirements:
- (A) Record data from monitored parameters at least once every minute for CEMS.
 - (B) Record data from monitored parameters at least once every 15 minutes for SCEMS.
 - (C) The acquisition rate shall be set at a constant rate such that the data points are equally spaced.
 - (D) The sample acquisition rate during certification and relative accuracy test audit(s) shall be the same as the sample acquisition rate during CEMS or SCEMS normal operation.
 - (E) Record all status codes specified in Table 2 for all data points.
 - (F) Utilize all valid data points to determine compliance with applicable limit(s), certification testing, and relative accuracy test audit(s).
 - (G) Incorporate all applicable data handling requirements specified in subdivision (i).

The New provisions are discussed at the following slides

218.3 (e)(4)(E)

Record All Status Codes Specified in Table 2

★ (E) Record all status codes specified in Table 2 for all data points. ⇒

- ✓ Rules 218 and 218.1 currently do not require recording status codes
- ✓ Many CEMS are currently recording some or all of the status codes
- ✓ Based on discussions with three CEMS vendors, status codes in Table 2 are generally incorporated into the software and existing software can be updated
- ✓ PR 218.3 will require that status codes in Table 2 to be recorded

Table 2
DAHS Status Codes
RULE 218.3

Status Code for the Following Parameters (True as 1 and False as 0)
Valid data point
Calibration
Monitoring system off-line
Alternative data acquisition
CEMS out-of-control
Fuel switch
10% of upper span value ¹ (concentration reported at 10% of upper span value when the monitored value was below 10% of upper span value)
Lower than 10% of upper span value ¹ (Concentration reported at the actual monitored value when the monitored value was below 10% of upper span value)
Above 95% of upper span value ²
Unit non-operational

1. 10% of upper span value of the lower span range for dual range analyzer or the lowest span range for multiple range analyzer
2. 95% of upper span value of the higher span range for dual range analyzer or the highest span range for multiple range analyzer

PR 218.3 (e)(4)(G)


Incorporation of Applicable Data Handling Requirements in Data Acquisition and Handling System

- ★ (G) Incorporate all applicable data handling requirements specified in subdivision (i).

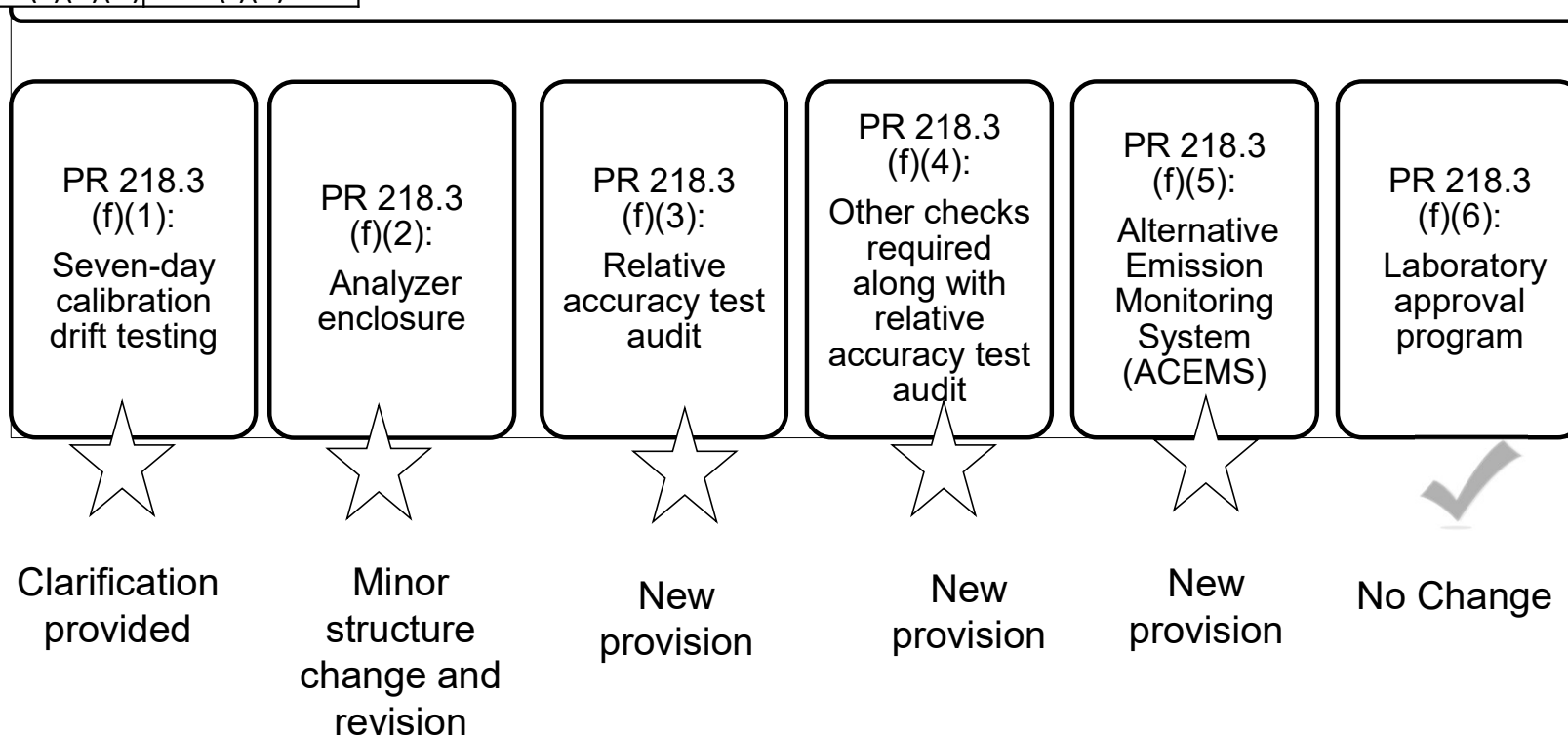
Subdivision (i) addresses data handling for:

- ✓ Data points below 10% of the upper span value
- ✓ Data points above 95% of the upper span value
- ✓ Emission data averaging method
- ✓ Data availability calculation
- ✓ CEMS out-of-control period and alternative data acquisition

Certification Requirement (f)

218.1	218.3
(b)(2)(A)	(f)(1)
(b)(2)(B)	(f)(2)
(b)(2)(C) 	(f)(3)
(b)(3)	(f)(4)
None	(f)(5)
Part of 218 (c)(1)(A)	(f)(6)

218.3 (f)



PR 218.3 (f)(1) – Seven-Day Calibration Drift Testing

- Calibration Error Testing is a critical element of the CEMS certification
- Rule 218.1 (b)(2)(A) specifies a “Calibration Error Test”
 - Subparagraph includes more than a calibration error test
 - Purpose of this subparagraph is to ensure that the CEMS is stable, and the measurements are not “drifting” outside of a specified range
- PR 218.3 (f)(1) will rename this provision as the “Seven Day Calibration Drift Test” to be more comprehensive of the provisions in this paragraph
 - Provisions are restructured for clarity
 - Added more specificity

PR 218.3 (f)(1) – Seven-Day Calibration Drift Testing

PR 218.3

Proposed Revisions

- Changed provision as the “seven-day calibration drift”
- Specified test is performed for each span range for the same seven-day testing period added for clarity
- Added 2-hour grace period for each test
- Specified calibration error test for stack flow monitors
- Referenced calculation equation in Table 3

(1) Seven-Day Calibration Drift Testing

The owner or operator of a CEMS shall perform a seven-day calibration drift test for each span range for pollutant analyzers, diluent analyzers, and stack flow monitors.

(A) A seven-day calibration drift test shall be comprised of a series of eight (8) calibration error tests during a seven-day period performed once each day with an interval of 24 hours plus a 2-hour grace period for each test.

(B) Each calibration error test shall be performed for:

(i) Pollutant and diluent analyzers, at the low and high ranges, which is at 0 to 20, and 80 to 100 percent of the upper span value; and

(ii) Stack flow monitors, by introducing a zero-reference value to the transducer or transmitter.

(C) Calibration error for each calibration error test during the entire testing period, as calculated using Equation 1 in Table 3, shall not exceed:

(i) 2.5 percent of the upper span value of the span range for pollutant and diluent analyzers, and

(ii) 3.0 percent of the upper span value of the span range for stack flow monitors.

(2) Analyzer Enclosure

- (A) The analyzer shall be contained in an environmentally controlled enclosure and equipped with an alarm and temperature recording device that provides an audible alert that the temperature drift for the analyzer exceeds the manufacturer's recommended specifications. The owner or operator of the CEMS shall make corrective actions within 4 hours of receiving the audible alert.
- (B) In lieu of subparagraph (f)(2)(A), the owner or operator of the CEMS shall perform the 2-hour calibration error tests in meeting the analyzer enclosure requirement, provided that the 2-hour calibration error is performed:
- (i) Once every two hours as close to 2-hour intervals as practicable, with total of thirteen consecutive tests performed;
 - (ii) When ambient temperature is expected to vary diurnally at least 30 degree Fahrenheit (°F); and
 - (iii) At the low and high ranges, which is at 0 to 20, and 80 to 100 percent of each span range respectively.
 - (iv) With calibration error meeting the requirements specified under subparagraph (f)(1)(C).
- (C) The owner or operator of the CEMS shall qualify for an exemption from subparagraph (f)(2)(A) to provide environmental controls for the analyzer enclosure by demonstrating that the CEMS is located:
- (i) In a geographic area where seasonal high and low temperatures do not exceed the operational temperature specifications for the analyzer;
 - (ii) In a geographic area where monthly maximum temperature variation is less than 30°F for all months of the year; and
 - (iii) The CEMS is located in a site that is protected from radiation and convection heating sources.

PR 218.3 (f)(2) – Analyzer Enclosure

- ✓ Restructured the rule language for easier comprehension
- ✓ Specified when the corrective actions should be made

PR (f)(3)

PR 218.3

Specifications for the Relative Accuracy Test Audit

218.1	218.3
(b)(2)(C)	(f)(3)(A)
(b)(2)(C)	(f)(3)(B)
(a)(23) RATA Definition	(f)(3)(C)
None	(f)(3)(D)
(b)(2)(C)	(f)(3)(E)

PR 218.3 (f)(3): Relative Accuracy Test Audit

(f)(3)(A): Minimum of nine sets of test

(f)(3)(B): Determine an outlier

(f)(3)(C): Calculating the relative accuracy

(f)(3)(D): Calculating a *de minimis* value

(f)(3)(E): Standards for relative accuracy and *de minimis*

No change

Specified the guidance document

Moved calculation equation
from definition to appendix table
for rule reference

New provision

New provision

(f)(3)(B) – Determine an Outlier
(f)(3)(C) – Calculating the Relative Accuracy

(3) Relative Accuracy Test Audit

The owner or operator of a CEMS shall perform a relative accuracy test audit for pollutant concentration that is not corrected by diluent gas, O₂/CO₂ diluent gas concentration, stack flow, and emission rate, whichever is applicable to the CEMS, in the as-found unit operating condition.

(A) There shall be a minimum of nine sets of test data generated.

(B) If the number of tests exceeds nine sets, data may be discarded if it is identified as an outlier according to the South Coast AQMD Technical Guidance Document R-004 (TGD R-004), or for valid reasons (e.g., process upsets, CEMS malfunction, etc.) which must be substantiated with appropriate documentation and subject to approval by the Executive Officer.

(C) The relative accuracy shall be calculated according to Equation 4 in Table 3 and expressed as a percentage.

- ✓ The South Coast AQMD Technical Guidance Document R-004 is not identified under Rule 218.1 but it has been referenced in practice
- ✓ PR 218.3 (f)(3)(C) is a new provision with the purpose of referencing the calculation equation
- ✓ Calculation equations are included the definition of each test under Rule 218.1, which are now listed in Table 3 under RP 218.3

(f)(3)(D)

PR 218.3

Calculating a *de minimis* Value

(D) Alternatively, a *de minimis* value shall be determined according to Equation 5, Equation 6, and Equation 7 in Table 3 for pollutant/diluent gas, stack flow, and mass emission respectively.

- ✓ New rule language
- ✓ Provide equations to clarify how to calculate a *de minimis* value
- ✓ Reference Rule 2012 for the equations

Table 3
Equations - continued
RULE 218.3

Test	Equation #	Equation	Where:
Relative Accuracy Test Audit – <i>de minimis</i> (Stack Flow Monitoring System)	6	$ d + cc \leq 2 \text{ feet per second} \times A \times \underline{cf}$	<p> d = Absolute value of the mean difference in units of standard cubic feet per hour.</p> <p> cc = Absolute value of the 95% confidence coefficient</p> <p>A = Stack cross sectional area in the plane of measurement.</p> <p><u>cf</u> = Conversion factor to standard cubic feet per hour.</p>
Relative Accuracy Test Audit – <i>de minimis</i> (Mass Emission Rate)	7	$ d + cc \leq (c \times s \times A) \times \underline{cf}$	<p> d = Absolute value of the mean difference in units of standard cubic feet per hour.</p> <p> cc = Absolute value of the 95% confidence coefficient</p> <p>c = Pollutant <i>de minimis</i> or mean concentration</p>

PR 218.3 (f)(3)(E) Standards for Relative Accuracy and *De Minimis* of a Relative Accuracy Test Audit (RATA)

(E) The owner or operator of the CEMS shall meet the following relative accuracy or *de minimis* value (no more than):

(i) For pollutant concentrations, a relative accuracy of 20.0 percent of the mean value of the reference method, or the *de minimis* concentration as follows:

Pollutant	<i>De minimis</i>
NOx	<u>0.5 ppm</u>
SO ₂	2.0 ppm
CO	2.0 ppm (or the rule or permitted concentration limit for the unit when <u>it is lower than 2.0 ppm</u>)

Reduced Sulfur Compounds 4.0 ppm

(ii) For diluent concentrations, a relative accuracy of 10.0 percent of the mean value of the reference method, or a relative accuracy of 20.0 percent when the measured diluent gas, O₂ or CO₂, is at or below 15 percent, or the *de minimis* value of 1.0 percent diluent gas.

- ✓ PR 218.3(f)(3)(E)(i) & (ii) – Revised from Rule 218.1:
 - Reduced NOx *de minimis* from 1.0 ppm to 0.5 ppm
 - Provided a standard for units with CO emission limit < 2.0 ppm
 - Added *de minimis* 1.0% for CO₂ (only for O₂ previously)
 - Allowed 20.0% for O₂/CO₂ when its measured value is low

- ✓ PR 218.3(f)(3)(E)(iii) & (iv):
 - Standards for the relative accuracy test audit on stack flow and mass emission rate
 - No change from Rule 218.1

PR 218.3 (f)(4) – Other Checks Required Along With Relative Accuracy Test Audit (RATA)

PR 218.3

PR 218.3 (f)(4)

- Re-structured with no requirement changes:
 - Response Time (f)(4)(A)
 - Cyclonic Flow (f)(4)(E)
 - Linearity Error (f)(4)(F)
- Added:
 - NOx Converter Efficiency (f)(4)(B)
 - Sampling System Bias Check (f)(4)(C)
(Both tests are conducted in practice and also included in certification guidance document)
- Relocated technical details to Attachment B for:
 - Concentration Stratification (f)(4)(D)
- Removed
 - Interference check 218.1 (b)(3)(A) (Not conducted in practice)
 - Calibration error 218.1 (b)(3)(B) (Already required for 7-day drift and ongoing QAQC)

- (B) NOx Converter Efficiency
NOx converter efficiency test shall be conducted to indicate an average converter efficiency greater than 90 percent.
- (C) Sampling System Bias Check
 - (i) The CEMS system bias shall not exceed 5.0 percent of each span range for pollutant analyzers.
 - (ii) The owner or operator of the CEMS shall include in the facility QA/QC Plan, criteria for excessive drift (e.g. control limits on cumulative drift) and appropriate diagnostic techniques to identify sources of analyzer drift and system bias when control limits are exceeded.
- (E) Concentration Stratification
The owner or operator of the CEMS shall demonstrate the absence of stratification and locate the CEMS probe in accordance with Attachment B.

PR (f)(5)
Specifications for Alternative Emission Monitoring System
(ACEMS)

PR 218.3

PR 218.3 (f)(5):
Certify Alternative Emission
Monitoring System (ACEMS)

(f)(3)(A): According to the criteria specified in 40 CFR Part 75
Subpart E



New provision

(f)(3)(B): Substitute criteria acceptable upon approval



New provision

(f)(3)(C): Substitute submitted to EPA as an amendment to the State
Implementation Plan



New provision

PR (f)(5)

PR 218.3

Specifications for Alternative Emission Monitoring System (ACEMS)

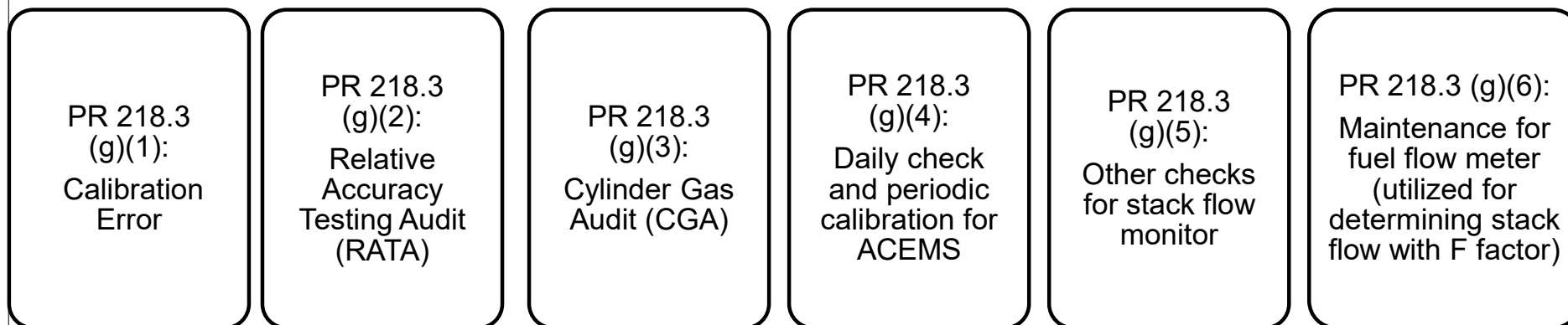
- (5) Alternative Emission Monitoring System (ACEMS)
- (A) In lieu of certifying a CEMS according to the requirements specified in paragraphs (f)(1) through (f)(4), the owner or operator shall request the Executive Officer to certify an alternative emission monitoring system that is at a minimum equivalent in relative accuracy, precision, reliability, and timeliness to a CEMS for that unit, according to the criteria specified in 40 CFR Part 75 Subpart E.
- (B) Substitute criteria is acceptable if the applicant demonstrates to the satisfaction of the Executive Officer that the proposed alternative monitoring device is at minimum equivalent in relative accuracy, precision, reliability, and timeliness to a CEMS for that unit.
- (C) Upon approval by the Executive Officer, the substitute criteria specified in subparagraph (f)(5)(B) shall be submitted to the federal Environmental Protection Agency as an amendment to the State Implementation Plan (SIP).

- ✓ Not specified in R218/218.1
- ✓ New provision, based on R2012 Chapter 2 Alternative CEMS certification requirements

Quality Assurance Testing Requirements

218.1	218.3
(b)(4)(A)	(g)(1)
(b)(4)(C)	(g)(2)
(b)(4)(D)	(g)(3)
None	(g)(4)
None	(g)(5)
None	(g)(6)

PR 218.3 (g)









Each paragraph under this subdivision includes new provision(s) which will be discussed in the following slides

PR (g)(1) Specifications for 24-Hour Calibration Error (CE)

PR 218.3

PR 218.3 (g)(1): 24-Hour Calibration Error

- (g)(1)(A): Test every 24 hours (with a 2-hour grace period) at the low and high ranges  Revision
- (g)(1)(B): Grace period at the unit restart  New provision
- (g)(1)(C): Specification for the calibration error test result  No change
- (g)(1)(D): Test result triggering the QA/QC plan revision  No change
- (g)(1)(E): Data validation period (24 hours plus a 2-hour grace period)  New provision
- (g)(1)(F): Data validation for the unit restart period  New provision

(1) Calibration Error

The owner or operator of a CEMS shall perform the calibration error test for pollutant analyzers, diluent analyzers, and stack flow monitors. The calibration error test is not applicable to an ACEMS or a fuel flow measuring device in conjunction with F-factor in determining stack flow.

(A) A calibration error test shall be performed for:

- (i) Pollutant and diluent analyzers, for every 24 hours with a 2-hour grace period during which emissions are generated, at the low (0 to 20 percent) and high (80 to 100 percent) of the upper span value of each span range; and
- (ii) Stack flow monitors, for every 14-day period during which emissions flow through the stack, by introducing a zero reference value to the transducer or transmitter

(B) A calibration error test shall be performed within 4 hours of the unit restart, if the unit restart is after a period longer than the testing cycle specified in subparagraph (g)(1)(A) when no emissions are generated.

(C) A successful calibration error test, with the calibration error calculated using Equation 1 in Table 3, shall not exceed two times the calibration error specification in subparagraph (f)(1)(C) for each range.

(D) Any calibration error test result, which does not exceed two times the calibration error specification in subparagraph (f)(1)(C) but is greater than the specification in subparagraph (f)(1)(C), shall be addressed by the QA/QC Plan for possible remediation.

(E) Data recorded by the CEMS pollutant and diluent analyzers are validated for 26 clock hours (i.e., 24 hours plus a 2-hour grace period) beginning from the hour of completing a successful calibration error test, and either ending after 26 hours, or ending at the hour of failing any quality assurance test specified under subdivision (g) within the 26-hour period.

(F) Data recorded by the CEMS at the unit restart that are prior to the hour of completing a successful calibration error test are validated starting from the hour of unit restart, if the owner or operator of the CEMS conducts a successful calibration error test in accordance with subparagraphs (g)(1)(B) and (g)(1)(C).

PR 218.3 (g)(1): Calibration Error

- ✓ Previous language for test frequency in Rule 218.1 (b)(2)(A) “as close to 24-hour intervals as practicable” is vague
- ✓ Added 2-hour grace period for regular operation, and 4-hour grace period for unit restart after one or more unit non-operation days
- ✓ Stack flow monitor test requirements are based on Rule 2012 for RECLAIM CEMS

- ✓ No requirement change for subparagraphs (g)(1)(C) and (g)(1)(D)

- ✓ Added provisions for CEMS data validation under subparagraphs (g)(1)(E) and (g)(1)(F)
- ✓ Provision needed to determine if data is valid or invalid
- ✓ Based on CFR 40 Part 75 data validation for calibration error

PR 218.3 (g)(2) Relative Accuracy Test Audit

PR 218.3

PR 218.3 (g)(2): Relative Accuracy Test Audit (RATA)

(g)(2)(A): Test frequency



Revision

(g)(2)(B): Requirement to comply for the test



No change

(g)(2)(C): Reference the paragraph for the relative accuracy or *de minimis* standards



No change

(g)(2)(D): Test due date for a unit restart



New provision

PR 218.3 (g)(2) - Relative Accuracy Testing Audit

PR 218.3

(2) Relative Accuracy Test Audit

The relative accuracy test audit shall be performed for pollutant concentration that is not corrected by diluent gas, O₂/CO₂ diluent gas concentration, stack flow, and emission rate, whichever is applicable to the CEMS.

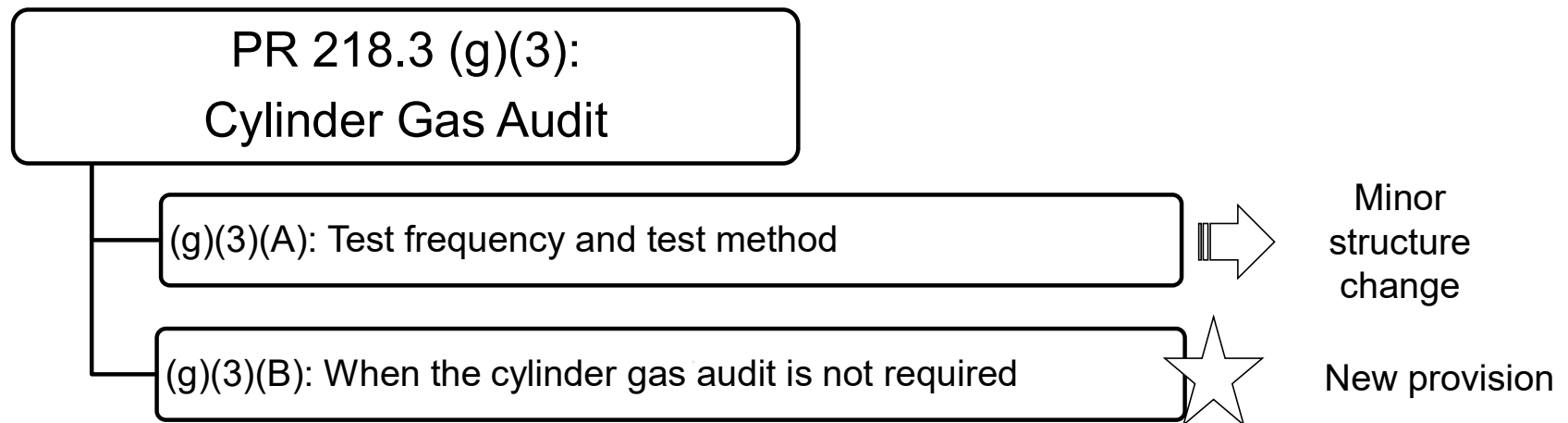
- (A) A relative accuracy test audit shall be performed within 12 months from the date of the previous relative accuracy test in the as-found unit operating condition.
- (B) During any relative accuracy test audit, the owner or operator shall comply with all the requirements in paragraphs (f)(3) and (f)(4), except that the owner or operator of the CEMS:
 - (i) Is not required to conduct linearity error check.
 - (ii) May request a waiver from stratification, cyclonic flow, and/or interference requirements in subparagraphs (f)(4)(E), (f)(4)(F) and (f)(4)(G), respectively, by submitting to the Executive Officer, for approval, any applicable documentation or previous test or historical data that meets the stratification, cyclonic flow, and/or interference requirements.
- (C) The CEMS shall meet the relative accuracy or *de minimis* standards as specified in paragraph (f)(3).
- (D) If the unit for which the CEMS is certified to monitor is not operating or generating emissions when a relative accuracy test audit is due, the relative accuracy testing audit shall be performed within 14 days after the unit is restarted.

- ✓ Rule 218.1 requires RATA conducted once every 12 months, no later than the end of the calendar quarter in which the date of the original certification test was performed
- ✓ Not practical to refer to the original certification test date
- ✓ Removed that reference under PR 218.3

- ✓ Aligns with Rule 2012 for RATA at a unit restart
- ✓ Not specified in R218.1

PR 218.3 (g)(3)

Cylinder Gas Audit for Pollutant and Diluent Gas Analyzers



PR 218.3 (g)(3)

Cylinder Gas Audit for Pollutant and Diluent Gas Analyzers

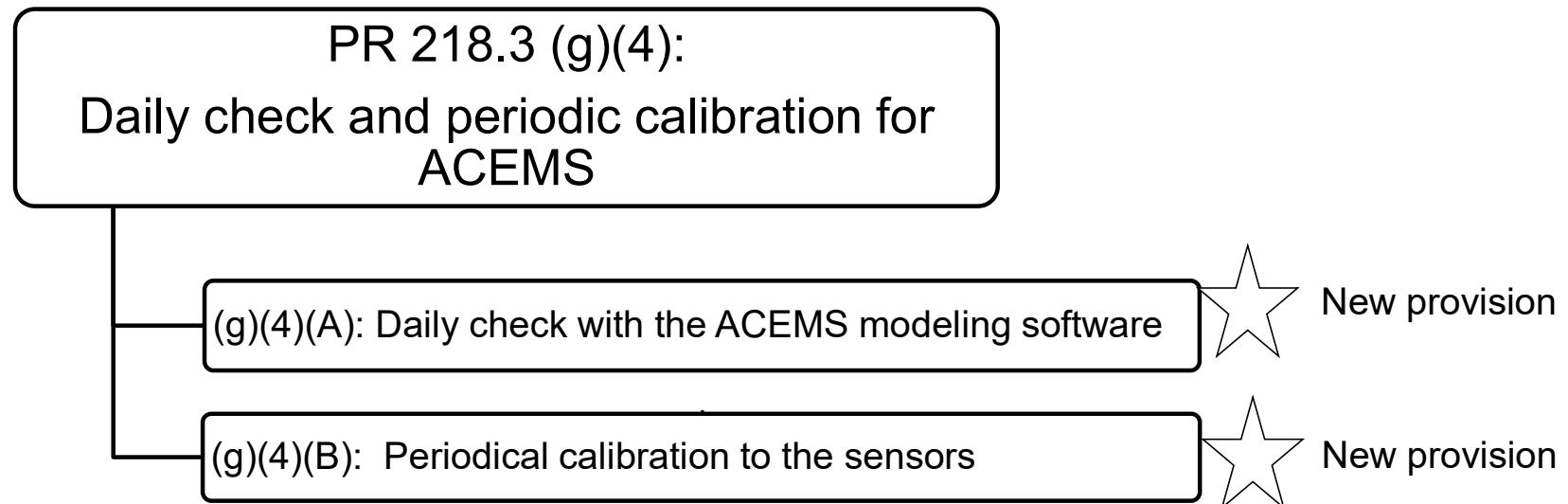
- (3) Cylinder Gas Audit for Pollutant and Diluent Gas Analyzers
- (A) A cylinder gas audit shall be conducted:
- (i) For every calendar quarter when relative accuracy test audit is not conducted, but in no more than three quarters in succession;
 - (ii) According to the provisions of 40 CFR 60, Appendix F; and
 - (iii) Using calibration gas as specified in subdivision (h).
- (B) The owner or operator of the CEMS is not required to conduct the cylinder gas audit for a calendar quarter when it is due, provided that within that calendar quarter:
- (i) The CEMS has passed a linearity error check; or
 - (ii) The accumulative unit operating hours are no more than 168 hours.

✓ (g)(3)(A): Based on the existing Rule 218.1 requirement with more organized rule language

- ✓ (g)(3)(B):
- Allow linearity error check to substitute cylinder gas audit
 - Exempt the test for a quarter with minimal operation

PR 218.3 (g)(4)

Daily Check and Periodic Calibration for ACEMS



PR 218.3 (g)(4)

PR 218.3

Daily Check and Periodic Calibration for ACEMS



- (4) In lieu of paragraph (g)(1), the owner or operator of an ACEMS shall conduct:
- (A) Daily checks with the ACEMS modeling software to:
- (i) Verify that the emission values generated by the ACEMS modeling software are consistent as certified, given specific parameter inputs;
 - (ii) Perform the daily check pursuant to the same schedule specified in clause (g)(1)(A)(i) and subparagraph (g)(1)(B); and
 - (iii) Validate the same time period as defined in subparagraph (g)(1)(E) with a successful daily check.
- (B) Periodic calibrations of the sensors pursuant to manufacturer's specifications for each component.

- Not specified in Rule 218.1 or Rule 2012
- Addressed in the ACEMS QAQC plan and conducted in practice

PR 218.3 (g)(5) Other Checks for Stack Flow Monitor

PR 218.3

PR 218.3 (g)(5):
Other Checks for Stack Flow Monitor

- (g)(5)(A): Daily flow monitor interference check  New provision
- (g)(5)(B): Leak detection  New provision

PR 218.3 (g)(5) Other Checks for Stack Flow Monitor

PR 218.3


- (5) The owner or operator of a stack flow monitor shall conduct:
- (A) Daily flow monitor interference checks, according to the same schedule as specified in clause (g)(1)(A)(i) and subparagraph (g)(1)(B), with each interference check validating the same time period as specified in subparagraph (g)(1)(E); and
 - (B) A leak detection check no later than the end of each calendar quarter, if the stack flow is determined by a differential pressure flow monitor.

- ✓ Rule 218.1 does not provide clear specification on calibration error and other checks for stack flow monitor
- ✓ This proposal is based on the existing requirements in Rule 2012 for RECLAIM CEMS stack flow monitor


PR 218.3 (g)(6) Maintenance for Fuel Flow Meter

PR 218.3

PR 218.3 (g)(6):
How to Maintain a Fuel Flow Meter

(g)(6)(A): In accordance with the manufacturer's recommendation 

New provision

(g)(6)(B): Include it in the CEMS QA/QC plan 

New provision

PR 218.3 (g)(6)

Maintenance for Fuel Flow Meter

- (6) The owner or operator of a fuel flow measuring device in conjunction with F-factor in determining stack flow shall:
- (A) Maintain the fuel flow measuring device in accordance with the manufacturer's recommendation; and
 - (B) Include the maintenance schedule and activities in the CEMS QA/QC plan.

- Not specified in Rule 218.1 or Rule 2012
- Currently addressed in the CEMS QAQC plan and implemented in practice

Next Steps – Rulemaking Process

- Next Working Group Meeting – November 2020
 - PR 218.3 Preliminary Draft Rule Overview by Provisions (h) to (k)
- Public Workshop – 4th quarter 2020
- Public Hearing – 1st quarter 2021

Staff Contacts

Rules 218 Series Development

- Yanrong Zhu
Air Quality Specialist
(909) 396-3289
yzhu1@aqmd.gov
- Gary Quinn, P.E.
Program Supervisor
(909) 396-3121
gquinn@aqmd.gov
- Michael Krause
Planning and Rules
Manager
(909) 396-2706
mkrause@aqmd.gov

Other Rule Contacts

General RECLAIM Questions	Gary Quinn, P.E.	Program Supervisor	909-396-3121	gquinn@aqmd.gov
	Kevin Orellana	Program Supervisor	909-396-3492	korellana@aqmd.gov
Proposed Rule 1109.1	Heather Farr	Program Supervisor	909-396-3672	hfarr@aqmd.gov
	Sarady Ka	Air Quality Specialist	909-396-2331	ska@aqmd.gov
Rule 1147	Gary Quinn, P.E.	Program Supervisor	909-396-3121	gquinn@aqmd.gov
	Shawn Wang	Air Quality Specialist	909-396-3319	swang@aqmd.gov
Proposed Rule 1147.1	Gary Quinn, P.E.	Program Supervisor	909-396-3121	gquinn@aqmd.gov
	Steve Tsumura	Air Quality Specialist	909-396-2549	stsumura@aqmd.gov
Proposed Rule 1147.2	Gary Quinn, P.E.	Program Supervisor	909-396-3121	gquinn@aqmd.gov
	James McCreary	Assistant Air Quality Specialist	909-396-2451	jmccreary@aqmd.gov
Rule 1150.3	Kevin Orellana	Program Supervisor	909-396-3492	korellana@aqmd.gov
	Isabelle Shine	Air Quality Specialist	909-396-3064	ishine@aqmd.gov
Rule 1179.1	Kevin Orellana	Program Supervisor	909-396-3492	korellana@aqmd.gov
	Melissa Gamoning	Assistant Air Quality Specialist	909-396-3115	mgamoning@aqmd.gov

Other Rule Contacts – cont.

Proposed Amended Rule 1117	Kevin Orellana	Program Supervisor	909-396-3492	korellana@aqmd.gov
	Rudy Chacon	Air Quality Specialist	909-396-2729	rchacon@aqmd.gov
Rule 1110.2	Kevin Orellana	Program Supervisor	909-396-3492	korellana@aqmd.gov
	Rudy Chacon	Air Quality Specialist	909-396-2729	rchacon@aqmd.gov
Rule 1134 & Rule 1135	Michael Morris	Planning and Rules Manager	909-396-3282	mmorris@aqmd.gov
	Uyen-Uyen Vo	Program Supervisor	909-396-2238	uvo@aqmd.gov
Rules 1146, 1146.1, & 1146.2	Gary Quinn, P.E.	Program Supervisor	909-396-3121	gquinn@aqmd.gov
	Kalam Cheung, Ph.D.	Program Supervisor	909-396-3281	kcheung@aqmd.gov
	Lizabeth Gomez	Air Quality Specialist	909-396-3103	lgomez@aqmd.gov
	Shawn Wang	Air Quality Specialist	909-396-3319	swang@aqmd.gov
Rule 1118.1	Heather Farr	Program Supervisor	909-396-3672	hfarr@aqmd.gov
	Steve Tsumura	Air Quality Specialist	909-396-2549	stsumura@aqmd.gov