Requirements for Continuous Emission Monitoring

Proposed Amended Rules (PAR) 218 and 218.1

Working Group Meeting #4

August 1, 2019
1:30 pm

Teleconference number: 1-888-450-5996
Passcode: 385105

South Coast AQMD Headquarters
Diamond Bar, California

Agenda

- Background and Approach
- Progress of Key Topic Discussion
- Key Topics for Working Group (WG) #4 Discussion
- Next Step

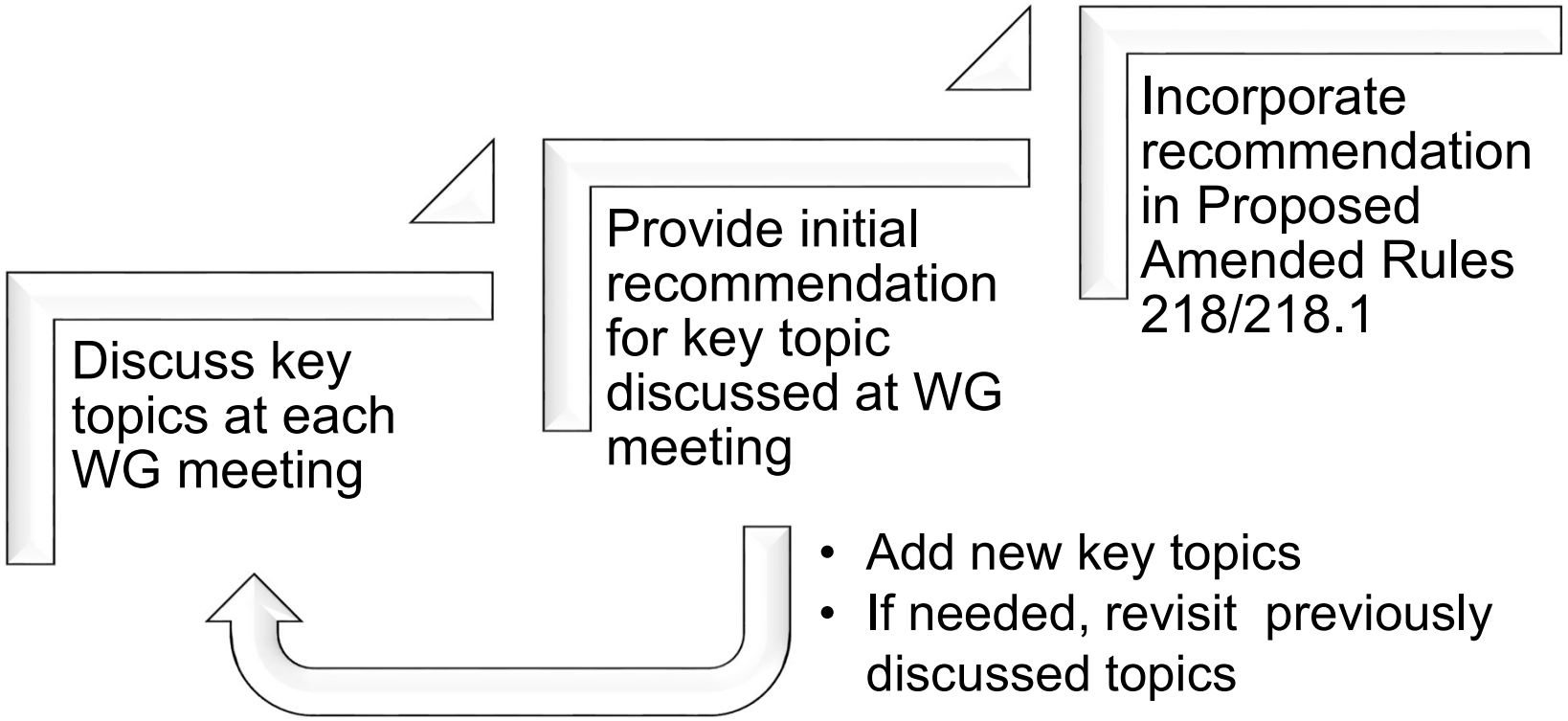
Background and Approach

Background and Approach

- RECLAIM is transitioning to a command-and-control structure
- Current monitoring, reporting, and recordkeeping (MRR) requirements on CEMS are defined by:
  - Rule 218 and 218.1 for non-RECLAIM facilities
  - Rule 2012 Chapter 2 for RECLAIM facilities
- PAR 218 and 218.1 requirements would apply to
  - Any facility with CEMS
  - Harmonize requirements for key topics

Progress of Key Topic Discussion

Overall Approach to Address Key Topics*



*Key topics related to proposed rule language

Progress of Key Topics Discussion

Key Topics	Discussion	Initial Recommendation
1. PAR 218/218.1 Applicability	Applicable to all pollutants, but the focus of this amendment will be on NOx MRR requirements	No change to applicability
2. Semi - Continuous Emission Monitoring System (SCEMS)	• R218/218.1 includes time-shared CEMS in SCEMS definition • Rule 2012 has specification on time-shared CEMS • No impact to NOx sources to retain R218/218.1 SCEMS requirements	• No change to definition of SCEMS • Retain SCEMS requirements in PAR 218/218.1

Progress of Key Topics Discussion – cont.

Key Topics	Discussion	Initial Recommendation
3. NO2 to NO Conversion efficiency test	Specified in Rules 218/218.1 but not in Rule 2012	Require NO2 to NO conversion efficiency test
4. Reporting excess emissions	Would impact RECLAIM CEMS of non-Title V sources that report all mass emissions but not excess emissions	Require reporting excess emissions for all units with CEMS
5. The standards for "existing" CEMS	Obsolete requirements in Rules 218/218.1	Remove the requirement

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
6. Full Span Range (FSR)	With concentration limit being established for facilities exiting RECLAIM, their Full Span Range should be aligned with the Rules 218/218.1 requirements	Use the Rules 218/218.1 requirements and possible additional recommendations
7. Missing Data Procedure	Required for RECLAIM sources, but no longer needed for concentration based monitoring	Remove the requirement

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
8. Strip chart recorder	The existing CEMS Data Acquisition and Handling System (DAHS or DAS) would be sufficient	Remove the requirement
9. Quality assurance (QA) test report submittal	• Not required by Rules 218/218.1 • Required by Rule 2012 • RECLAIM facilities submit QA test report summary by Electronic Data Reporting (EDR)	Require all PAR 218/218.1 facilities submit QA test report for all applicable pollutants via EDR

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
10. PAR 218/218.1 alignment with EPA's Part 75	• An analyzer at or below 30 ppm span level is common in this area; • PAR 218/218.1 are also applicable for pollutants not regulated by Part 75; • Part 75 linearity check data could be used to calculate CGA; • PAR 218/218.1 CEMS monitored units may often have off-line time	• Continue to require CGA instead of linearity check; • May allow linearity check as an alternative in complying with CGA requirement; • Continue to allow certain tests to be conducted off-line

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
11. CEMS data availability threshold	• Addition clarification needed to minimize misinterpretation; • Current R218/218.1 has defined a threshold of 95% data availability	• Clarify the definition and calculation method for data availability; • Exclude the startup and shutdown hours allowed by permit condition from data availability calculation • When data availability falls below 95%, some requirements could be triggered

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
12. CEMS measuring low emissions	Stakeholders expressed difficulty meeting a 7-day calibration drift standard for CEMS measuring low emissions	Considering an alternative standard
13. Certification testing	Certification testing requirements were summarized at the WG meeting	• Remove the requirements specific for RECLAIM (e.g., bias test for bias adjustment factor) • Update the Rule 218/218.1 guidance document for certification test accordingly

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
14. Recertification and diagnostic tests	Any modification that may affect the description on the CEMS certification letter would require the CEMS application (Form ST-220) and the applicable tests according to Technical Guidance Document R-002	• The recertification requirements should not change • PAR 218/218.1 will provide clarification for recertification requirements • Staff will assess if the guidance document should be updated

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
15. Performance Standards for Relative Accuracy Test Audit (RATA)	Relative accuracy and *de minimis*/Alternative Standards required by different regulations were compared	• No change to the relative accuracy standards in PAR 218/218.1 (10% for O2/CO2, 20% for NOx concentration and mass emission, and 15% for flow); • Specify calculation method on meeting *de minimis* standards; • Retain R218/218.1 *de minimis* standards, but add *de minimis* 1.0% for CO2 and reduce the current NOx *de minimis* standard from 1.0 ppm to a lower level

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
6, 11, 12, and 15	Discussion Today	Revisit for additional recommendations
16. The option of complying with Part 60 Appendices B & F (*alternative to Rule 218.1 standards*)	Discussion Today	Pending

Progress of Key Topic Discussion – cont.

Key Topics	Discussion	Initial Recommendation
17. Valid Hour and Hourly Average	Future WG Meeting	Pending
18. Alternative data acquisition when CEMS is out of control	Future WG Meeting	Pending
19. Calibration Gas	Future WG Meeting	Pending
20. Alternative CEMS	Future WG Meeting	Pending
Other Topics	Future WG Meeting	Pending

Key Topics for WG #4 Discussion

Key Topics for Today's WG Meeting

Key Topics #

6. Full Span Range requirements – additional recommendations
11. CEMS data availability threshold – potential requirements when data availability falls below 95%
12. CEMS measuring low emissions – alternative standard for 7-day drift test
15. Performance standards for RATA – lower *de minimis* standard for NOx
16. The option of complying with Part 60 Appendices B & F (alternative to Rule 218.1 standards)

Key Topic #6

Full Span Range requirements

	Pollutant Full Span Range (FSR) requirements
Rule 2012	<u>All data points</u> • Within 10 – 95% of the full scale span range
Rules 218/218.1	<u>All data points</u> • Within 10 – 95% of the range <u>Full Span Range</u> • Set at 150 – 200% of the concentration limit

Full Span Range requirements

Key Topic #6

- The initial recommendation is to use Rules 218/218.1 requirements for Full Span Range

Challenge:

- There are situations when the Full Span Range is set at 150 – 200% of the concentration limit but the measured data fall below 10% of the range
- Those situations are more likely to occur to CO analyzers, as the actual CO emissions could be much lower than the applicable CO limit

Key Topic #6

Full Span Range Requirements- Additional Recommendation

- When Full Span Range is set at 150 – 200% of the concentration limit but the measured data falls below 10% of the range, staff proposes to:
  - Allow Full Span Range only to meet the setting at 150 – 200% of the concentration limit, and measured data below 10% of the range to be reported at the 10% of the span range; and
  - Consider data below 10% of the range as valid data if CEMS is meeting all the QAQC requirements

CEMS Data Availability Threshold - Initial Recommendations

Key Topic #11

- Clarify the definition and calculation method for data availability (40 CFR 75.32 definition on data availability would be referenced)
- When data availability falls below 95%, potential requirements could be triggered
- Exclude the startup and shutdown hours allowed by permit condition from data availability calculation

For further discussion

CEMS Data Availability Threshold - Initial Recommendations – cont.

Key Topic #11

- Hours being excluded for data availability calculation

Existing Rule 218/218.1	PAR 218/218.1
• Periods of CEMS calibration, maintenance, repair, or audit for up to 40 hours/month	• Period of CEMS maintenance, repair, or audit for up to 120 hours/calendar year (equivalent to 10 hours/month) • Daily calibration hours (30 hours/month) would be valid maintenance/QAQC hours by Key Topic #17 proposal

CEMS Data Availability Threshold - Initial Recommendations – cont.

Key Topic #11

- Potential requirements when data availability falls below 95%

≥ One calendar quarter

- Report the incident and the corrective actions
- Revise QAQC plan, if needed
- Conduct a RATA within 30 days and any other test the Executive Officer may suggest

≥ Two consecutive calendar quarters*

- Provide a temporary alternative within 30 days
- Modify or replace the CEMS, and recertify it within 180 days following the end of the second quarter failure

* This is a combination of information from internal discussion and documents of external agencies (e.g., New Jersey Department of Environmental Protection CEMS Guidelines)

CEMS Data Availability Threshold - Comment and Response

Key Topic #11

- Stakeholders commented that SCR annual maintenance should be excluded from data availability calculation, as this exclusion could maintain data availability
- In some cases permit condition allows unit operation at SCR maintenance
- A permit condition may provide relief for unit operation during maintenance, but does not exempt emission monitoring and integrity of the monitoring system
- Staff response:
  - When the control device is undergoing maintenance and the unit has to be operating, dual range analyzer is recommended with the higher range monitoring the period without emission control
  - Under this approach data availability would not decrease

Key Topic #12

CEMS Measuring Low Emissions

Stakeholders Comment

- Difficulty meeting a 7-day calibration drift standard for CEMS measuring low NOx emissions at initial certification

Staff Consideration

- An alternative standard

Analysis

- Reviewed in-house data
- Reached out to stakeholders for supporting data

Key Topic #12

CEMS Measuring Low Emissions

- Analysis of in-house data
  - Staff reviewed 7-day calibration drift test reports for NOx emission levels ranging from 2 ppm to 50 ppm
  - Found no indication of more difficulty for CEMS measuring lower emissions to meet the standard
  - Expectation that facilities always would be reluctant to release reports with failing results
- Outreach to stakeholders for supporting data
  - Stakeholders did not provide data indicating difficulties in passing the test
  - They recommended that the NOx cut off level for determining the alternative (*de minimis*) standard should be 10 ppm

CEMS Measuring Low Emissions – Initial Recommendation on 7-day Calibration Drift Alternative Standard

Key Topic #12

The regular 7-day calibration drift standard is 2.5%

Using the stakeholder recommended10 ppm of NOx as the cutoff level to estimate an alternative (*de minimis*) standard

The alternative standard would be estimated as 2.5% x 10 ppm = 0.25 ppm

- Rounded to 0.3 ppm requiring less significant numbers

Propose NOx 0.3 ppm as an alternative standard

- Determined by the difference between CEMS measurement to a calibration gas and its known concentration

Key Topic #15

Performance Standards for RATA – NOx *de minimis* Standard

Staff recommended at WG meeting #3

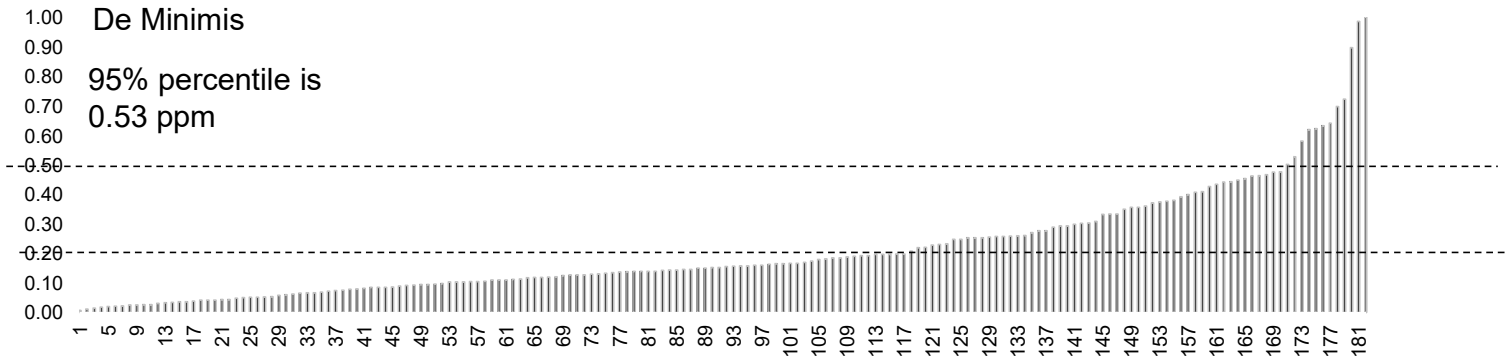
- To reduce the current NOx *de minimis* standard from 1.0 ppm to a lower level

Analysis to determine the new NOx *de minimis*

- Reviewed 189 sets of RATA results submitted in the past two years for turbines
- Excluded 7 sets of failing RATA results (NOx RA >20% and *de minimis* >1.0 ppm)
- The following graph depicts calculated *de minimis* (|d|+|cc|) for those 182 sets of results

Performance Standards for RATA – NOx *de minimis* Standard – cont.

Key Topic #15



171 out of 182 (94.0%): ≤0.5 ppm

Average: 0.23 ppm

- 171 out of 182 (94.0%) RATA tests for turbines have *de minimis* at or below 0.50 ppm
- For 11 tests with *de minimis* above 0.50 ppm, four of them measured NOx above 22 ppm (@15% O2)
- For those 171 RATA tests:
  - All measured NOx at or below 8 ppm (@15% O2)
    - 167 of them measured NOx at or below 5 ppm (@15% O2)
    - 77 of them measured NOx at or below 2.5 ppm (@15% O2)

Performance Standards for RATA – NOx *de minimis* Standard Initial Recommendation

Key Topic #15

- The current NOx *de minimis* standard, calculated as |d|+|cc|, should be reduced from 1.0 ppm to 0.5 ppm for units with NOx emission limit at or below 5 ppm
- Note: The NOx *de minimis* standard is determined by the formula |d|+|cc|, in which:
  - d = average of differences between the NOx concentration measurement system reading and the corresponding reference method in ppmv
  - cc = confidence coefficient as determined by the equations in Section 8 of 40 CFR Part 60, Appendix B, Performance Specification

Key Topic #15

Performance Standards for RATA – Recommendation on O2/CO2 Standard

Staff initially recommended at WG meeting #3

- To retain the relative accuracy (RA) standards in PAR 218/218.1 (10% RA for O2/CO2, 20% RA for NOx concentration and mass emission, and 15% RA for flow)

Stakeholders expressed that

- While R2012 and Part 60 Appendices B & F require 20% RA for O2/CO2, it is sometimes difficult to meet 10% RA for O2/CO2

Staff revised the recommendation for RA standard of O2/CO2

- 10% RA for O2/CO2
- When the measured O2/CO2 is at or below 15%, allow 20% RA for O2/CO2 with Executive Officer's approval

Complying with Part 60 Appendices B & F

Key Topic #16

- Rule 218 provides an option of referring to Part 60 Appendices B and F, instead of applicable paragraphs in Rule 218.1
  - For certification and ongoing QAQC requirements
- CEMS that opt to comply with Part 60 Appendices B and F are still required to comply with R218 (e) & (f) recordkeeping and reporting requirements

Complying with Part 60 Appendices B & F – cont.

Key Topic #16

- Certification requirements
  - Part 60 requires less tests
    - Certain tests are specified in Rule 218.1 but not listed in Part 60 Appendices B & F:
      - System bias check
      - NOx conversion test
      - Response test
      - Tests for systems with no CEMS enclosure
    - In practice, all CEMS conduct those tests at initial certification regardless of compliance with Part 60 or Rule 218.1

Complying with Part 60 Appendices B & F cont.

Key Topic #16

- R218/218.1 and Part 75 are more stringent than Part 60 Appendices B & F requirements
- Recommend to phase out the Part 60 option for those requirements

	Part 60	**R218/218.1 and Part 75**
7-day drift (for certification)	Meet the standard 6 out of 7 days (for CO)	Meet the standard for all 7 days
Daily calibration Out-of-control period (ongoing QAQC)	• 2 times the performance standard (i.e., 5.0% for NOx) over five consecutive days; or • 4 times the performance standard (i.e.,10.0% for NOx) for any one test	2 times the performance standard (i.e., 5.0% for NOx) for any one test

Complying with Part 60 Appendices B & F cont.

Key Topic #16

- Data points above 95% of Full Span Range (FSR)
  - Defined as invalid data points by R218/218.1 and Part 75
  - Part 60 is silent on validity for data above 95% of span
  - Recommend to define invalid data points above 95% for all CEMS, for consistency
- Relative Accuracy Test Audit (RATA) standards
  - Discussed as Key Topic #15 at WG #3, and recognized the difference between R218/218.1 and Part 60
  - Initial recommendation is to retain R218/218.1 standards
  - The option of referring to Part 60 RATA standards to be phased out

Complying with Part 60 Appendices B & F cont.

Key Topic #16

- Operating load for RATA
  - Part 60 requires RATA conducted at more than 50% of the normal operating load
  - Tests are currently conducted consistently with R218/218.1, which requires RATA conducted at normal operating load
- Numbers of runs for RATA
  - Part 60 allows the tester to reject up to 3 runs at their discretion
  - R218/218.1 requires criteria and approval for rejecting any run

Complying with Part 60 Appendices B & F cont.

Key Topic #16

- Calibration gas requirement
  - Key topic to be discussed in a future Working Group meeting
  - Recommend a consistent requirement for all CEMS
- Valid hour and hourly averaging
  - Will be discussed as Key Topic #17

R218.1 vs. Part 60 Appendices B & F

Key Topic #16

Initial Recommendation Summary

	Initial recommendation for CEMS that have opted to Part 60 Appendices B & F requirements
Certification tests	• Phase out Part 60 option for those requirements • EO has discretion to approve otherwise (e.g., Operation load for RATA below normal load) • Requirements will be effective at next CEMS recertification
7-day drift standard	
Out-of-control period	
Data point >95% of span	
RATA standard	
Operation load for RATA	
Numbers of runs for RATA	
Calibration gas requirement	

Recap – Key Topics discussed today

Initial recommendation was provided for each topic below:

6. Full Span Range requirements – additional recommendations when data is not within 10-95% of span
11. CEMS data availability threshold – potential requirements when data availability falls below 95%
12. CEMS measuring low emissions – 0.3 ppm allowable difference as alternative standard for 7-day drift test
15. Performance standards for RATA – lower *de minimis* standard for NOx to 0.5 ppm
16. The option of complying with Part 60 Appendices B & F (alternative to Rule 218.1 standards)

Key topics for the next Working Group Meeting

17. Valid hour and Hourly Average
18. Alternative data acquisition when CEMS is out of control
19. Calibration Gas
20. Alternative CEMS
21. Others

Next Steps

- Next Working Group Meeting – September 2019
- Public Workshop/Public Consultation – October 2019
- Public Hearing – December 2019

Staff Contacts
Rule 218/218.1 Development

- Yanrong Zhu
  Air Quality Specialist
  (909) 396-3289
  yzhu1@aqmd.gov

- Gary Quinn, P.E.
  Program Supervisor
  (909) 396-3121
  gquinn@aqmd.gov

General and Landing 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

Rules 1146

- Lizabeth Gomez
  Air Quality Specialist
  (909) 396-3103
  lgomez@aqmd.gov

Rule 1110.2

- Kevin Orellana
  Program Supervisor
  (909) 396-3492
  korellana@aqmd.gov

General and Landing Rule Contacts – cont.

Rule 1135

- Uyen-Uyen Vo
  Program Supervisor
  (909) 396-2238
  uvo@aqmd.gov

Rule 1134

- Michael Morris
  Planning and Rules Manager
  (909) 396-3282
  mmorris@aqmd.gov

Proposed Rule 1109.1

- Sarady Ka
  Air Quality Specialist
  (909) 396-2331
  ska@aqmd.gov

Proposed Rule 1179.1

- Melissa Gamoning
  Assistant Air Quality Specialist
  (909) 396-3115
  mgamoning@aqmd.gov

General and Landing Rule Contacts – cont.

Proposed Rule 1147.1

- Shawn Wang
  Air Quality Specialist
  (909) 396-3319
  swang@aqmd.gov

Proposed Rule 1147.2

- James McCreary
  Assistant Air Quality Specialist
  (909) 396-2451
  jmccreary@aqmd.gov

Proposed Rule 1150.3

- Lisa Wong
  Assistant Air Quality Specialist
  (909) 396-2820
  lwong@aqmd.gov