

**SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT
COMPLIANCE DEPARTMENT**

COM 2025

APPROVED: _____ **SIGNED** _____ **DATE:** June 14, 2007
Jon Adams
Director of Compliance

TITLE: RULE 1080 STACK MONITORING

SUBJECT: CONTINUOUS EMISSION MONITORING SYSTEM POLICY

OBJECTIVE:

Establish guidelines on the procedures for monitor operation, emission limits, and reporting requirements for facilities with Continuous Emission Monitoring Systems (CEMs). These guidelines are designed to ensure correct operation of monitors resulting in accurate measurement and recording of emissions data.

PURPOSE:

The purpose of this policy is to establish guidelines for ensuring conformance with the requirements as specified by the United States Environmental Protection Agency (EPA) for the operation of monitoring systems at facilities required to operate CEMs. The Guidelines also set forth the requirements and procedures for the reporting of excess emissions and monitor down times to the District and California Air Resources Board (CARB) according to the specified time requirements.

POLICY STATEMENT:

Requirements for the installation and operation of CEMs are specified under 40 CFR Part 51 Appendix P, District Rules, or through the EPA Acid Rain program (40 CFR Part 75). Facilities operating CEMs shall develop and implement written procedures for Quality Assurance and Quality Control (QA/QC) in accordance with the procedures found under 40CFR Part 60 Appendix F or 40CFR Part 75 Appendix B. All monitoring systems must meet minimum requirements set forth in the policy for the data to be considered valid.

DEFINITIONS:

1. ***Continuous Monitoring System (CMS)***. Includes, but is not limited to, continuous emissions monitoring systems, continuous opacity monitoring systems, continuous parameter monitoring systems, or other manual or automatic monitoring that is used for demonstration of compliance with an applicable regulation on a continuous basis as defined by the regulation.
2. ***Continuous Opacity Monitoring System (COMS)***. A continuous monitoring system that measures the opacity of emissions.

3. **Continuous Emission Monitoring System (CEMS).** The total equipment required to sample, condition, analyze and to provide a permanent record of emissions or process parameters.
4. **Predictive Emission Monitoring System (PEMS).** A system that uses processes and other parameters for determining gas concentrations or emission rates. Operational parameter measurements are processed via a conversion equation, a graph, or computer program to produce results in units of the applicable emission limitation or standard.
5. **Diluent Gas.** A major gaseous constituent in a gaseous pollutant mixture. For combustion sources, CO₂ and O₂ are the major gaseous constituents of interest.
6. **Span Value.** The upper limit of a gas concentration measurement range that is specified for affected source categories in the applicable subpart of the regulation.
7. **Zero, Low-Level, and High-Level Values.** The CEMS response values related to the source span value.
8. **Calibration Drift (CD).** Is the difference in the system output reading from a reference value after a period of operation during which no unscheduled maintenance, repair or adjustment took place. The reference value may be supplied by a cylinder gas, gas cell, or optical filter.
9. **Relative Accuracy (RA).** The absolute mean difference between the gas concentration or emission rate determined by the CEMS and the value determined by the Reference Methods (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. The allowable accuracy limit will be in the applicable Performance Standard (PS). This test must be done once every four quarters.
10. **Excessive Calibration Drift.** For 40 CFR Part 60, the CEMS are out-of-control if either the zero (low-level) or high-level CD result exceeds twice the applicable drift specification in Appendix B (2.5 percent of the span value) for five consecutive daily periods, or exceeds four times the applicable drift specification during any CD check. For a facility subject to 40 CFR Part 75, the limits are 5.0 percent for SO₂/NO_x and 1.0 percent of O₂/CO₂.
11. **Out -Of-Control Period.** The system is considered out-of-control whenever a CEMS or COMS fails a periodic quality assurance audit (such as daily calibrations, CGA/Linearity or RATA). The out-of-control periods are different for 40 CFR Part 60 and 40 CFR Part 75 analyzers, yet for some facilities the CEMs will have a combination of Part 60 and Part 75 requirements.
 - For 40 CFR Part 60 CEMs, the beginning of the out-of-control period is the time corresponding to the completion of the fifth consecutive daily CD check in excess of two times the allowable limit, or the time corresponding to the completion of the daily CD check preceding the daily check that results in a CD in excess of four times the allowable limit. The end of the out-of-control period is the time corresponding to the completion of the CD check following corrective action that results in the CD's at both the zero (or low-level) and high-level measurement points being within the corresponding allowable CD limit.
 - For 40 CFR Part 75 CEMs the out-of-control period begins with the hour of completion of the failed calibration error test and ends with the hour of completion of a valid calibration error test. CEMS data may not be used in calculating emission compliance or be counted towards meeting minimum data availability as required and described in the applicable subpart during an out-of-control period.
12. **Cylinder Gas Audit (CGA).** A cylinder gas audit is performed in any quarter that a RA audit test is not done or three out of four calendar quarters, but at least two months apart. The CEMS is challenged with audit gas of known concentration at two points within the analyzer range span. The audit gas should be injected as close to the probe tip as possible so the gas travels through the entire sampling system. Each audit gas is injected three times with

sufficient time allowed for the system to stabilize. The three runs are averaged and compared to the known gas values, the test results for Part 60 CEMS must be within +/-15 percent or +/- 5 ppm, whichever is greater. For a Part 75 facility, a three-point linearity check is required on all ranges used for NOX, SO₂, CO₂, and O₂. The limits are 5.0 percent or 5 ppm for NOX/ SO₂, and 5.0 percent or difference of 0.5% for CO₂/O₂.

13. *One-hour period*. Means any 60-minute period commencing on the hour.

REQUIREMENTS FOR CONTINUOUS MONITORING SYSTEMS:

All continuous monitoring systems must meet minimum performance specifications as found in 40 CFR Part 51 App. P, 40 CFR Part 60.13, and 40 CFR Part 75.10 in order for the monitoring data to be valid. All systems must conduct a daily calibration of the system, a low level (0-20% span) and an upper level (50-100% span) calibration gas. The continuous monitoring system must be able to complete a cycle (sample, analyze and record an emission measurement) in the required time, opacity monitors (COMS) for each successive 10-second period and emissions (CEMS) for each successive 15-minute period. Opacity is averaged over 6-minute periods using 36 or more equally spaced data points, for emissions other than opacity an hour average is computed from 4 or more data points equally spaced over each 1-hour period. A full operating hour period means the unit combusted fuel for a 60-minute period commencing on the hour and had a valid data point in each 15-minute quadrant of the hour.

There are provisions to allow partial operating hours where a valid hour may be calculated if there was a valid data point for each quadrant of the hour the unit operated (a minimum of 2 data points if there was a calibration, quality assurance, or maintenance activities in the hour) but this does not apply to all pollutants. In 40 CFR Part 60 subpart GG (60.334) for gas turbines allows partial hours for NO_x, O₂/CO₂ and 40 CFR Part 75 subpart B (75.10) for NOX, SO₂ and O₂/CO₂. There are proposed amendments to 40 CFR Part 60 to harmonize the requirements of Part 60 with Part 75 for all pollutants.

A CEM Quality Assurance (QA) and Quality Control (QC) program is required in both 40 CFR 60 Appendix F and 40 CFR 75 Appendix B. The regulations specify that the facility must develop a written QA plan that includes QC procedures for system calibration, inspection, preventative maintenance, and system and performance audits. This plan needs to be implemented and updated periodically to reflect any changes needed to assure reliability and performance.

STANDARDS OF PERFORMANCE:

Continuous monitoring systems must pass performance specification tests (relative accuracy test audit (RATA) and 7 day calibration-drift test) in order for the system to be certified and the data collected to be valid. The procedures for performing the RATA tests are found in 40 CFR Part 60 App. B. These tests only validate that the system is capable of accurately recording the emissions during that test, it was not designed to be a long-term evaluation of the performance of the system. The daily calibrations and quarterly audits are used to evaluate the system on a shorter time frame. The 7-day drift test can be seven consecutive days or seven consecutive operating days depending on which subpart the analyzer falls under.

40 CFR Part 60 CMS

Pollutant	40 CFR 60 App B	Part 60 RA% (RM / App Std.)	CD % of span	CGA (2 point)	Out of Control (1 day / 5 days)
CO	PS4, 4A	10% / 5%, 5ppm	2.5%	15%	4*CD/2*CD
NOx	PS 2	20% / 10%	2.5%	15%	4*CD/2*CD
SO ₂	PS 2	20% / 10%	2.5%	15%	4*CD/2*CD
O ₂	PS 3	1% O ₂ Difference	.5% O ₂	15%	4*CD/2*CD
CO ₂	PS 3	1% CO ₂ Difference	.5% CO ₂	15%	4*CD/2*CD
H ₂ S	PS 7	20% / 10%	2.5%	15%	4*CD/2*CD
VOC	PS 8	20% / 10%	2.5%	15%	4*CD/2*CD
Opacity	PS 1	3%	2%	N/A	N/A

40 CFR Part 75 CMS

Pollutant	40 CFR 60 App. B	RATA (semi-ann, annual)	CE (range >200 ppm / <200 ppm)	Linearity Test (3 point)	Out of Control Period
NOx	PS 2	10%, 7.5%,	2.5% / 5 ppm	5% or 5 ppm	5% of span
SO ₂	PS 2	10%, 7.5%,	2.5% / 5 ppm	5% or 5 ppm	5% of span
O ₂	PS 3	10% , 7.5%	.5% O ₂	5% or .5%O ₂	> 1% O ₂
CO ₂	PS 3	10%, 7.5%	.5% CO ₂	5% or .5% CO ₂	> 1% CO ₂
Flow		10%, 7.5%	3%		>6%

Note: Alternatives for annual RATA's for Part 75, SO₂ difference +/- 8 ppm, NO_x +/- 0.01 lb/MMBtu (low emitters).

CMS DATA REDUCTION AND RECORDKEEPING:

The CMS data acquisition and handling system must be able to receive the output signal from the analyzers and other parameter inputs to calculate at the least a minimum of a data point for each quadrant of the hour to determine an hour average for both the raw data and in the units of the applicable emission limits. For averaging periods greater than one hour, the most recent successive one-hour averages will be used to compile the designated averaging period value.

QUARTERLY REPORTS:

A facility that operates a CMS, including a predictive emission monitoring systems (PEMS), must submit a quarterly report to the District for any excess emissions that occurred during the quarter and monitoring system downtime. The report is due by the 30th day after the end of each quarter. Excluding daily calibrations, the report should include the total hours of operation of the emission unit, periods of excess emissions (date, duration, and magnitude), and monitor downtime (date and duration). The District designee shall examine the report for accuracy and compile all the quarterly reports and forward them to the EPA. One District designee per region shall be assigned this task.

See, Compliance Assistance Bulletin, **Continuous Emission Monitor (CEM) Reporting Requirements**

REPORTING REQUIREMENTS FOR VIOLATIONS:

Excess emissions must be reported to the District within 96-hours of the exceedance. The notification should clearly indicate that it is an excess emission report and must include the permit number, date, pollutant, units of the limit, emission limit, actual emission level, time period, cause of the exceedance, corrective actions taken, and a copy of the CEMS data for the days that the exceedance occurred. With a reporting time of 96-hours the facility should be able to supply the required information in detail as compared to the brief information often contained in a breakdown notification. Excess emission reporting information can be found in the Compliance Assistance Bulletin – “Continuous Emission Monitor (CEM) Reporting Requirements”.

Under California Health and Safety Code section 42706, the District is required to report any emission violation to the ARB within five (5) working days of when the facility reports it. The report to ARB must include the above information and any action taken or planned by the District. If a final action is not known at this time, a follow-up report should be made with the final action taken on the emission violation. This information is contained in the CARB Advisory, “CEM Reporting” , Number 67, May 14, 1991.

The excess emissions report form shall be completed and faxed to the ARB within (5) working days by the area inspector assigned to the stationary source. A copy of this form is posted on the Compliance Intranet site.

See, **COM 1185: CEMS EXCESS EMISSIONS REPORTING**

CMS BREAKDOWNS:

A facility operator may seek breakdown relief in the event of monitoring equipment failure. Section 10.0 of Rule 1080 requires a facility operator to notify the District as soon as reasonably possible, but no later than eight hours after detection. However, Section 6.1 of Rule 1100 requires a facility operator to report a breakdown within one hour of detection, which conflicts with Rule 1080. Because Rule 1100 is more stringent, the facility operator seeking breakdown relief must report any breakdown condition to the District within one hour of detection.

The breakdown relief period for continuous monitoring equipment shall not exceed 96 hours. Should the condition extend beyond 96 hours, the facility operator should contact the District to commence the procedure for obtaining an emergency variance.

See, **COM 2035, EQUIPMENT BREAKDOWN POLICY**

CMS MAINTENANCE:

The facility operator must provide a notice to the District within 24-hours of any planned shutdown of any monitoring system equipment, per Section 10.0 of Rule 1080. Such a notice is not required for any maintenance or QA/QC activity on the system if the operator expects the down time to be less than four hours, but the operator must still report these periods in their quarterly report. A courtesy

notice from the facility operator is helpful should the maintenance activity result in an emission exceedance recorded in the District's CEMS polling system.

ANALYZER REPLACEMENT:

Over time, analyzers and system components will fail. Some equipment may be repaired and placed into service in a relatively short time, but components with older systems may no longer be supported and replacement parts may no longer be available. Should an analyzer fail, the facility should report a breakdown to the District and inquire about obtaining a variance for the time period necessary in order to install and test any new analyzer or system components.

Should an analyzer that is subject to 40 CFR Part 60 fail, a temporary replacement analyzer may be installed and utilized while repairs are made. To verify the data, a seven (7) day calibration drift test and a CGA must be performed on the temporary unit that will be used for less than 30 days. A complete performance specification test is required if a permanent replacement analyzer is installed or a temporary analyzer will operate for more than 30 days. The requirements for analyzers subject to 40 CFR Part 75 must be followed according to those specifications.

INSPECTION OF CONTINUOUS MONITORING SYSTEMS:

The purpose of an annual inspection is to verify two main items: (1) that the emission and operating parameters are within permitted limits, and (2) the CMS is being operated in a manner to assure accurate data. The annual source test gives a quantitative verification that the CMS are operating in compliance while the inspection insures that the site maintains the monitoring system.

Pre-site inspection activities, review excess emissions and breakdowns reported since the last inspection. Check the status of the District CEMS polling system for the site for missing days of data.

Control Room Inspection.

1. Verify whether the emissions are being displayed for the operator to monitor.
2. Note whether the alarms are set to indicate when an emissions exceedance occurs or is pending to alert the operator so as to prevent or reduce excess emissions.
3. Review CEMS data printouts.
4. Perform a hand calculation to check the CEM data such as the raw ppm value to the O₂ corrected value.
5. The facility should have a written policy on site for QA/QC.

Inspecting the continuous monitoring system.

1. Examine whether the system is enclosed in an area that is environmentally controlled.
2. Verify that the analyzers are the same as those reported in the quarterly reports
3. Check the calibration gas span values for the ranges used, expiration dates, and tank pressures.
4. Check the condition of the heated sample line, and note whether there is any visual damage, sagging, or kinks. If monitored, the line temperature should be above 250 degrees F.
5. If the system is time shared between stacks, check the amount of time each stream is sampled.
6. Check the moisture removal system to see if condensate is being removed.
7. Check to see if the calibration gas values in the data acquisition and handling system are the same as described on the bottles.
8. Review the facility's maintenance log.

RECOMMENDED TRAINING:

California Air Resources Course #221 Continuous Emission Monitoring.
EPA , APTI Course #474 Continuous Emissions Monitoring Systems.