

Preparing for a CEMS Audit

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Agenda

- Why you could be audited
- Who audits
- Audit Preparations
 - Data Review
 - Documentation Review
 - Log Books
 - QA Plan
 - Monitoring plan
- Audit Process

Reasons for Audits

- Increased numbers of failed calibrations
- Lower monitor availability
- Data questionability
 - CO2 Audits
 - Flow-to-Load
 - Heat input changes
 - Increased or continual “informational” errors

More Reasons for Audits

- Continual late quarterly reports
- EPA / State Data reviews
- Part of Annual Compliance Review



NOTIFICATION OF THE AUDIT



Audit Notification

- Audit will be by letter from CAMD to Designated Rep.
 - May be follow-up with a phone call from Regional CAMD rep to you or primary person who submits quarterly reports via ECMPS
- Start getting ready for audit
- Depending on how much lead time given attempt to do the following



PREPARING FOR THE AUDIT



Getting Ready for Audit

- Review the QA Plan
- Review the Monitoring Plan
 - Including analyzer Spans/ranges
- Review the plant log book
- Review QA test submissions
- Review Emissions data
- Prepare the plant staff

QA PLAN

- A living, breathing document that is both required and **MUST** be followed.
- Some consider this a contract between site and regulatory agency
- Should be required review for anyone that touches CEMS, responds to alarms, signs any documents, does any reporting.....

QA Plan Reviews

- Part's 75, 60, 63 and State or Local air programs ALL require periodic review of your QA program
 - In general, annually is specified at a minimum
 - Document that this has been done
 - Is this your task or does your facility have a QA team?



QA Plan Contents

- QA plan should include, at a minimum:
 - Procedures for System operation
 - Procedures for conducting QA Tests
 - Preventative Maintenance procedures
 - Recordkeeping methods and processes
 - Reporting frequency
 - Schedules for when each of the above is done
 - Who, or what plant role is responsible for each

QA Plan Contents

- QA Test procedures should be written for:
 - Daily calibration error tests
 - Daily interference tests for flow monitors
 - Quarterly linearity tests
 - Quarterly flow-to-load evaluations (both stack flow and fuel flow meters, as applicable)
 - Semi-annual or annual RATAs

QA Plan Contents

- Preventative Maintenance procedures should be written:
 - Routine (Daily or Weekly) checks
 - Monthly analyzer specific checks
 - Quarterly checks
 - Semi-annual or annual tasks.
- Referencing the analyzer O&M manual is acceptable



QA Plan Contents

- Recordkeeping and Reporting
- QA Plan should include:
 - Information that informs the techs if work that is done to analyzer triggers recertification and notifications.
 - Requirements for use of the CEMS Logbook
 - What gets logged
 - When it gets logged
 - How it is logged
 - Who Logs it!



QA Plan Contents

- Recordkeeping and Reporting overview
 - Monitoring plan review frequency
 - Notification schedules, e.g. 30-day pre-test protocol submittal... notification timeline for date changes for tests
 - Who should be notified
 - Who will report to agency
 - How information is to be reported

QA Plan Contents

- Recordkeeping and Reporting overview
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Monitoring Plans

- Part 75 requires both electronic and hardcopy monitoring plans
 - The monitoring plan contains information describing the unit, CEMS, other monitoring methodologies, and specific calculation procedures
 - Some of this is contained only in Hardcopy Monitoring plan;



Hardcopy Monitoring Plans

- 40 CFR 75.53(e)(2) and (f)(2) outline requirements for CEMS and for specific situations,
- Some items required in HC plan:
 - Diagrams / Engineering drawings
 - Calculations for determining analyzer spans, ranges, maximum values for data substitution, etc.
 - Data validation strategy
 - Testing strategy



Review of Monitoring Plans

- Review the monitoring plan for accuracy
 - Hardcopy, like the QA plan is a living document
 - Conduct analysis of analyzer MPC, MER (if applicable), span, ranges
 - Analyzer unit capacity as listed in monitoring plan
 - Analyze unit load – load boundary's
- Ensure that monitoring plan correctly reflects how your CEMS is operated



Plant Log Book Review

- Log book can be electronic or hardbound
- Conduct site review of technicians entries
 - Ensure that maintenance work and required QA testing post work has been completed and reported
- Electronic logbook has no edits
- Hardcopy is in ink, dated, initialed, AND ALL ENTRIES are legible,



EPA Policy Manual

- Policy Manual 12.10
 - Should be incorporated into QA Plan
 - Not 100% complete BUT is a great resource and guide for CEMS work and required post work QA testing.

<https://www.epa.gov/airmarkets/clean-air-markets-part-75-emissions-monitoring-policy-manual>



Certification Test Review

- Review RATA, Linearity and other periodic tests for accuracy and completeness
 - Compare hardcopy reports to what is in DAHS and ECMPS submissions
- Review recertification and diagnostic test events
- Review test extension notifications – ensure they have been submitted, if applicable



Emissions Data Review

- Analyze, view and chart hourly data records for SO₂, CO₂, O₂, NO_X, and heat input.
- Calculate Hourly emissions data
- Recalculate Summary Data
- Verify Bias, if applicable, applied correctly

Plant Staff Review

- Notify Plant management of pending Audit
- Meet to discuss strategy for who will meet with auditor
- Plan to show auditor QA Plan, monitoring plan, calibration certificates, CEMS

Types of Audit

Audit Level	Records Review	On-site Inspection of CEMS	Daily Calibration Observation	Linearity or RATA Observation	Performance Test Audit
Level 1	✓	✓	✓		
Level 2	✓	✓	✓	✓	
Level 3	✓	✓	✓		✓

Level 1 may not have any prenotification

Level 2, if RATA observation, Notification is usually made

Level 3, Notification is always made



DAY OF THE AUDIT



Day of the Audit

- Inspector has done pre-Audit Homework
- Pre-Audit meeting
 - Credentials exchange
 - Auditor will give overview of site visit and list areas to be inspected
 - Including Technician testing requests
 - Records for review

Day of the Audit

- Will observe calibration, should request report and will re-calculate DAHS calculations
- Will discuss with Techs how Cal is run
- Will observe and record sample flows; calibration gas flows and pressures
- Make visual observations of sample lines, air conditioning system, etc.

Day of the Audit

- Will review analyzers and compare to what is listed in monitoring plan
- Will review calibration certification sheets, may compare values to targets entered into DAHS.
- Should request documentation of Annual Span/Range Evaluations

Day of the Audit

- Will review systems, both DAHS and Analyzers for alarms
- Will review log book and daily, monthly, quarterly check forms.
- May discuss information or review of QA test submitted via ECMPS.
 - Flow-to-low if applicable
 - K-factors



Day of the Audit

- DAHS Checks:
 - DAHS Verifications
 - Formula Verifications
 - Manually entered constants,
- QA Plan review Inspector will review this and may ask questions to any staff.
- Hard Copy monitoring plan, may review, but probably electronic is sufficient

Day of the Audit

- Inspector may request tech to perform Linearity.
 - Will review process and may request written procedures
 - Will review results and discuss “hands-off” meaning with tech.
- Possibly could bring own gas cylinders and request tech to use those

Day of the Audit

- Will review results and compare/calculate DAHS results versus hand calculations
- If RATA audit, let RATA team know. Inspector will have full access to RATA team for questions, protocol review, results review.
 - Will verify operating conditions, process controls, etc.

Day of the Audit

- Sites following Appendix D/G methodologies:
 - Will review of meter certifications
 - Fuel sampling analysis
 - Review of site maintenance / inspection records

Day of the Audit

- Exit Interview:
 - Inspector should discuss findings at a high-level but will not disclose full findings until summary report.
 - Inspector will submit report to EPA for their review
 - May send draft report to plant for comment

After the Audit

- Final Report:
 - May list things you are doing correctly and incorrectly
 - Pay attention to deficiency's
 - Develop plan to address deficiency's with Plant Management and all stake holders

After the Audit

- Review QA plan, update as needed
- Set structure in place to ensure that items address are corrected
- Audit report may request documentation or follow up proof that deficiency's addressed
 - May do follow up audit

Questions?

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