

DAILY LIFE of CEMS

QA & PM

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OVERALL CONCEPT

To provide the perspective of the folks that are responsible for the day-to-day CEMS operations, preventative maintenance, quality assurance, and reporting activities.

- Regulatory Background
- Routine Activities
- Skill Set Required
- Logistics / Expectations



SET IN THE FRAMEWORK OF USEPA MONITORING REGULATIONS

- These can be very tedious
- Requirements are located in several different parts and subparts of the EPA rules
- For example, let's look at the references to CEMS within Subpart DDDDD (Boiler MACT)...

BOILER MACT CEMS REFERENCES (1)

- §63.7525(a) for CO [note that emission limit is in ppm corrected to 3% O₂DRY; thus, requiring a mechanism for determining dry O₂)
 - Initial certification of CO CEMS by PS-4, or PS-4A, or PS-4B [40 CFR 60, Appendix B]
 - Ongoing CO CEMS QA by Procedure 1 [40 CFR 60, App. F]
 - Data reduction by §63.8(g)(2)
 - Oxygen trim system
- §63.7525(b) for PM
 - Initial certification of PM CEMS by PS-11 [40 CFR 60, App. B]
 - Ongoing PM CEMS QA by Procedure 2 [40 CFR 60, App. F]
 - Collect hourly average data and calculate arithmetic 30-day rolling average
- §63.7525(c) for opacity
 - Initial certification of COMS by PS-1 [40 CFR 60, App. B]
 - Ongoing COMS QA (as detailed in site-specific monitoring plan) must include daily calibration drift assessment, quarterly performance audit and annual zero alignment

BOILER MACT CEMS REFERENCES (2)

- §63.7525(l) for Hg and/or HCl (refers to §63.7540(a)(14) and §63.7540(a)(15), respectively)
 - Hg CEMS - initial certification by PS-6 and PS-12A [40 CFR 60, App. B]
 - Hg CEMS - ongoing CEMS QA by Procedure 2 [40 CFR 60, App. F]
 - Hg sorbent trap system - initial certification and ongoing QA by PS-12B [40 CFR 60, App. B]
 - Initial certification of HCl CEMS by applicable PS [40 CFR 60, App. B]
 - Ongoing HCl CEMS QA by QA procedures of 40 CFR 60, App. F
- §63.7525(m) for SO₂ as surrogate for HCl
 - Initial certification of SO₂ CEMS by 40 CFR 75
 - Ongoing SO₂ CEMS QA by QA procedures of 40 CFR 75, App. B

TAKE A BREATH...

The messages are:

- Somebody, somewhere needs to know this stuff in fine detail – or at least, know where to look it up
- Most likely, these are not the folks that are responsible for the daily “care and feeding” of the monitoring systems

CONTINUOUS EMISSIONS MONITORING



ROUTINE ACTIVITIES

- All instrumentation at a plant serve a useful purpose; however, one must be very aware that CEMS data have legal meaning and possible liabilities.
- Everything is pointed at providing acceptable quality data, and enough of it, to meet/exceed regulatory (legal) requirements.

ROUTINE ACTIVITIES – DAILY

[NOTE: Typically, CEMS are configured to perform automatic zero-span check every morning (early, say 5:00 AM)]

- Log in and check the morning auto calibration checks
- If all OK, move on
- If there is a failed daily calibration, or even significant drift, commence investigating the cause(s) – will eventually need to re-calibrate successfully
- Review data for quality assurance – compare to tolerances
- Make the rounds – record key instrument parameters, evaluating any drift, changes, etc.

ROUTINE ACTIVITIES – WEEKLY

- Some sources elect to utilize weekly “rounds” instead of daily rounds.
- Mercury trap changeout



ROUTINE ACTIVITIES – QUARTERLY (1)

- Conduct cylinder gas audits (“CGAs” – 40 CFR 60) and linearity checks (40 CFR 75); prior to that:
 - Evaluate “Are the systems ready for the quarterly challenge?”
 - Ensure using the correct Q/A procedure
 - If quarterly or non-routine Q/A tasks are to be performed, does system need to be reconfigured?
 - Consider plant operating conditions and weather conditions
 - How are the results of the test reported?

ROUTINE ACTIVITIES – QUARTERLY (2)

- Perform Preventative Maintenance on equipment (generally done just prior to quarterly audit)
- Conduct PM-CEMS ACA audits
- Conduct Hg audit of sorbent trap systems (verifies – dry gas flow meters, thermocouples, barometer, vacuum sensors)
- Prepare emissions reports
- Prepare quarterly audit reports

ROUTINE ACTIVITIES - ANNUALLY



- Relative Accuracy Test Audit
 - Those lovable stack testers are on-site
 - Typically, must supply real-time CEMS data for RATA
- Send in various PM-CEMS & Opacity filters, Hg sorbent trap audit kit for annual certification

ROUTINE ACTIVITIES – GENERALLY

- Scheduled monitor-specific routine preventative maintenance, such as inspecting and replacing gaskets, filters, etc.
- Maintain calibration gas inventory, ordering to avoid running out of gas
- Maintain adequate spare parts inventory
- Internal CEM reports – weekly, monthly, quarterly (in addition to compliance reports)
- Continually evaluate data drifts, trends, etc. to ask the questions:
 - Does the continuous use of this system cause it to deteriorate?
 - How can this deterioration be slowed or controlled?

SKILL SET NEEDED

- Obviously, working knowledge of instrumentation (electronics, pneumatics, etc.); able to troubleshoot and “fix it”
- Physically able to:
 - access monitor locations
 - handle the somewhat bulky system components
- Strong communication skills
- Intellectually able to comprehend the concepts of the regulations:
 - Where to find them (or whom to contact)
 - Compliance (legal) liabilities

Speaking of regulations...

SOMEONE NEEDS TO KNOW

Potential regulations involved: 40 CFR 60? 40 CFR 75? 40 CFR 63? These define (sometimes clearly, sometimes not):

- Initial certification requirements: Performance specifications (drift, accuracy, response time, etc.)... sometimes the timing of the test procedures is spelled out
- Instrument ranges
- Calibration gas ranges
- Ongoing quality assurance (specifications, frequency, etc.)
- What sort of QA testing is required when a system component is replaced
- Missing data substitution (Part 75)

LOGISTICS/EXPECTATIONS

Need to consider:

- Routine data “hand-off”
- What sort of information is expected and how frequently?
- Who is the contact person?
- What if there is a problem or loss of data or failed calibration?
- Who will confirm the appropriate regulations are identified?
- Who will track these regulations to ensure any changes are known?
- “Special” data requests?



QUESTIONS?

THANK YOU!!!

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