Daily Life of CEMS – "Owners Perspective"

CEMS really is a four letter word!

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Objectives

CEMS challenges and failures

CEMS will fail. A year in the life of a CEMS owner.

Current CEMS program and ownership

What we do everyday.
Who owns it.
When something fails who reacts.

Standardize CEMS program

Create a systematic approach to CEMS

CEMS challenges and failures

- Some examples of recent CEMS failures.
- CEMS are complicated – who understands them?

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- The 8-day period, in addition to other downtime in the quarter, pushed the facility over the 95% downtime compliance requirement.
- The result was an NOV from the regulatory agency.

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- Data was substituted for the 23 missing days no NOV was issued but a deviation was reported.

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- The instrument downtime in this quarter in combination with normal drift failures resulted in the facility failing to meet the 95% uptime requirement.
- An NOV was issued for excessive downtime in the quarter. (More to come on agency discretion).

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  - Equation installed assumes incorrectly that sample system is dry or wet

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  - **NSPS Subpart Db §60.48b,(3)f** states the following:

*"When NO_X emission data are not obtained because of CEMS breakdowns, repairs, calibration checks and zero and span adjustments, emission data will be obtained by using standby monitoring systems, Method 7 of appendix A of this part, Method 7A of appendix A of this part, or other approved reference methods to provide emission data for a minimum of **75 percent of the operating hours** in each steam generating unit operating day, in at least **22 out of 30 successive steam generating unit operating days**."*

CEMS systems are complicated – who understands them?

- Operators, instrument technicians and boiler/environmental staff generally have an understanding of the entirety and regulatory requirements of CEMS systems.
- In regards to CEMS - ***experience is really important***.
- What happens if any of the three major contributors at the facility experience turnover?
- What if the system is changed, the DAS or an instrument is changed?
- Regulation changes: Boiler MACT - PM or Mercury monitoring or GHG monitoring.
- Regulatory discretion – are we always vulnerable to how they want to interpret and enforce the rules?

Current CEMS program and ownership

- What we do everyday.
- CEMS are complicated – who understands them?

Current CEMS program and ownership

Daily Calibration Drift checks – follow up	Calibrations, Repairs, Routine PM	Quarterly PMs, Compliance Audits (CGA, RATAs)	Quarterly Reporting and Emissions Reporting	Program or Internal Standard
• 4 facilities use contractor to perform daily/weekly checks • 3 facilities use operators to perform daily/weekly checks	• Operators in 3 facilities perform calibrations if drift checks require action. • Contractors in 4 facilities perform calibrations if drift checks require action. • Instrument technicians at all facilities perform repairs and conduct routine PM	• CEMS integrator performs all quarterly system PMs and Quarterly Cal Gas Audits at all facilities. • RATAs performed by contractor chosen by each facility.	• Compiled at 2 facilities by contractor. • Report compiled and generated by 5 facilities by environmental staff.	• Currently no internal program for Corn Milling.

Day to Day Operations of CEMS

DAILY DRIFT CHECKS	• Several sites have chosen to perform 24-hour required drift checks on 8-hour or 12-hour intervals. This frequency was chosen to prevent 24-hour periods of instrument downtime.
CALIBRATIONS	• Instrument technicians and operators are reacting quicker to failed drift checks. • Recent NOVs and deviations provided increased scrutiny.
OPERATOR CARE	• Lack consistent ownership of CEMS within the site. • Operators and instrument techs need to have established procedures and checklists to verify CEMS is functional/accurate
QA/QC PLANS	• Specifically required in Appendix F of 40 CFR 60 – Procedure 1 • Description of the CEMS systems, QA procedures, CEMS equipment, equations, spare parts and flow chart. • Several QA/QC plans have elements that have changed and need to be updated.
DAS CONCERNS	• Working with DAS provider to verify all information in DAS. • Try to use the DAS at each facility as more than calibration record or strip chart recorder.

Standardize CEMS program

- **Build an internal program that provides a design and operation standard for CEMS systems**

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- A small team was assembled to create a CEMS CMO.
  - Standards for design
  - Location
  - CEMS system type(s)
  - Daily operation and minimum expectations
  - QA procedures and requirements
  - Redundancy
  - PMs
  - Alarms and engineered/installed warning indicators
  - Supplies, gases and spare parts
  - Training
  - Requirement to review annually the program/regulatory requirements
  - Audit

CEMS CMO

- Mandate environmental control for CEMS
  - Stand alone, climate controlled shelters.
- CEMS system design
  - Location of CEMS probe.
  - Design the system to prevent power interruption and alarm if power is lost.
  - Continuous monitoring of shelter temperature.
  - Indoor air quality monitoring for the shelter.
  - Flowchart – design and merging in Cargill's IT network.
- Limit CEMS choices for installation
  - Dilution
  - Dry extraction
  - Two of the most common CEMS choices for accuracy and long term protection of equipment.

CEMS CMO

- Standardize QA/QC plans by developing a common template.
- Expand on SOPs for CEMS operations and maintenance.
- Have each site bring QA/QC plan up to date.
- Standardize alarming at each site (examples)
  - Install sensors to detect when calibration gas levels are getting low.
  - Data trigger/alarms if values do not change for long periods
  - Power interruption
  - DAS emission limits
- Log book entry (every day activity is tracked)
- Develop daily and weekly checklists (operator care)
  - Track instrument diagnostics
  - Verify calibration gas pressures
  - Visit the shelter daily to observe operation

CEMS CMO

- Develop PMs on shelter critical items (HVAC, dessicant, housekeeping) and system items.
- Standardize spare parts and calibration gases with company procurement.
- Provide oversight and ownership to CEMS at each sight.
- Train all personnel who have roles in CEMS ownership.
- Environmental team will review CMO annually.
- Each site will review and update SOPs and QA procedures as necessary.

Summary

- CEMS have a lot of moving parts.
- CEMS can be very challenging and usually operate without oversight.
- Experience is important – often problems repeat and past experience helps.
- CEMS operation is a team and should be based on systematic approach.
- ***Do not let your CEMS operate in a giant black hole.***

QUESTIONS?

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