Performance Tests & RATAs

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What is a Performance Test?

- Commonly referred to as a stack test, trial burn or performance test
- A performance test is used to:
  - Measure the amount of regulated pollutants that are emitted from a point source;
  - Verify capture efficiency from a capture system;
  - Verify destruction/removal efficiency of a control device.
Types of Performance Testing

Most common types of testing are:

- Isokinetic Sampling
- Instrumental Sampling (Analyzers)
- To determine percent isokinetic:

\[
\%I = \% \text{isokinetic} = 100 \left( \frac{V_{\text{nozzle}}}{V_{\text{stack}}} \right) = \frac{0.0944 T_s (V_m)_{\text{std}}}{P_s V_s \left( \frac{\pi D^2}{4} \right) \Theta (1 - B_{ws})}
\]
Types of Performance Testing

• Most common types of testing are:
  
  – Isokinetic Sampling
  
  • Particulate matter (PM) – RM5/202, RM17, RM201A
  • Dioxins/Furans (D/Fs) – RM23
  • Chrome & other metals – RM29, RM306
  • Lead – RM12
USEPA Reference Method 5
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Sources of Particulate Matter

- Coal burning
- Cement production
- Grain Storage/Distribution
- Asphalt Production

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Types of Performance Testing

- Most common types of testing are:
  - Instrumental Sampling
    - CLD (Chemiluminescence Detector)
      » NOx – RM7E
    - FID (Flame Ionization Detector)
      » VOC - RM25A
    - NDIR (Non-dispersive Infrared)
      » CO – RM10
      » O₂/CO₂ – RM3A
    - Pulsed Fluorescence
      » SO₂ – RM6C
    - FTIR (Fourier transform infrared spectroscopy)
      » Non-diatomic molecules (mainly used for HAPs) – RM320
Sources of NO\textsubscript{x}, CO, SO\textsubscript{2}, VOC, HAPs

Refineries

Ethanol Plants

Printing Presses

Combustion sources

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Common Gaseous Controls

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Continuous Emissions Monitoring System (CEMS)

- Similar to analyzers used for instrumental sampling
- CEMS also available for measuring PM, mercury (Hg), flow rates, moisture, opacity
RATAs

- Relative Accuracy Test Audits
  - Quality assurance test for CEMS
  - Tested by comparing the Relative Accuracy (RA) between a tester’s analyzers (RM) against the CEMS
  - RATA consists of nine to twelve 21-minute runs
  - RA = (|avg diff| + |cc| / |avg RM|) * 100
Avoiding Problems
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  - Make sure to submit the test report timely
Avoiding Problems

- Time management
  - Don’t wait until the last minute to conduct the test
  - Make sure to notify within the specified deadline
    - Must be submitted at least 30 days prior to the test date, unless specified differently in the regulation
  - Make sure to submit the test report timely
    - Submit test report within 30 days after the final day of testing, unless specified differently in the regulation
Avoiding Problems

• Time management (con’t)
  • Try to give us an actual day if at all possible rather than the week of testing.
  • We understand that dates and start times can change for the testing, try to keep us in the loop.
Avoiding Problems

- Be ready
  - Make sure all parties know what is happening
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  • Must follow the test protocol
    • Changes to the schedule should be made no later than 7 days prior to the test
Avoiding Problems

- Be ready
  - Make sure all parties know what is happening
  - Stress to Operations the importance of the testing
  - Tests must be run at max load (>90%)
  - Must follow the test protocol
  - Ensure testers have what they need
    - e.g. electricity, proper test ports, safe testing location

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Avoiding Problems

• Be ready (con’t)
  • We try to notify the facility in some way when we are coming to observe a test.
  • Expect us
    • It should be no surprise when we show up
    • Any check in/security measures taken before we arrive will expedite the process and get us out of your hair sooner!
Avoiding Problems

- Be ready (con’t again)
  - Monitor required operating parameters during the test; be sure they are included in the report
    - Examples:
      - Load (lb/hr, ft/min, MW, tph, bhp, etc)
      - Controls (temperatures, pressure drops, water flow, etc)
      - Operating Parameters (fuel flow, HHV, manifold pressure, etc)
Performance Tests/RATAs

Total number of Performance tests in FFY 2016:
112 tests were conducted. 59 were RICE tests

Total number of RATAs from FFY 2016:
57 RATAs were conducted
Summary

• Most importantly…
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Stay *under* your emission limits!
Performance Testing & Asbestos Control Unit

- Performance Testing/RATA
  - Adam Irvin – Unit Supervisor
  - Allyson Prue – Performance Testing
  - Tina Gustafson - RATAs
- Asbestos Control Program
  - Phil Schlaman – Asbestos Expert
  - Tina Gustafson - Inspector
  - Sophia Brunetti - Admin

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