

**Title:** Continuous Opacity Monitor Correlation Guidelines

**Identification Number:** Air-012-NPD

**Date Originally Adopted:** April 10, 1997

**Dates Revised:** None

**Other Policies Repealed or Amended:** None

**Brief Description of Subject Matter:** Provides guidelines for correlation of opacity data for an alternate Continuous Opacity Monitor (COM) location.

**Citations Affected:** 326 IAC 3-1.1-2(5), Performance Specification 1

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The purpose of this nonrule policy is to provide guidelines to be used by sources that are proposing an alternate location for a Continuous Opacity Monitor (COM).

## **Background**

Federal regulations at 40 CFR 60, Appendix B, Performance Specification 1 require that continuous monitoring equipment meet certain specifications when used to demonstrate compliance with regulatory requirements. Section 4 of Appendix B, Performance Specification 1 provides installation requirements for a COM which would assure that representative data is collected. Indiana rules at 326 IAC 3-1.1-2 reference the Performance Specification 1 requirements for the installation of a COM. As with the federal regulations, Indiana rules also allow a source to propose an alternate location for the COM (326 IAC 3-1.1-2(5)).

## **Policy**

The following are guidelines for correlating continuous opacity monitor (COM) data with visible emissions data or with a reference continuous opacity monitor for the purpose of approving an alternate monitoring location. The alternate monitoring location is one which does not meet the criteria specified under 40 CFR 60, Appendix B, Performance Specification 1 (PS-1), Section 4.

There are two types of correlation testing which may be performed; only one of the two needs to be conducted in order to validate the alternate monitor location.

Any COM involved in the correlation testing must complete a calibration cycle (zero/upscale calibration) both before and after the correlation test period. If the daily calibration occurred not longer than two (2) hours prior to the initiation of the correlation period, that will satisfy the requirement for the pre-test calibration. If either the pre or post-test calibration does not meet the criteria for calibration drift in PS-1 ~ 2.0 % opacity), the correlation is invalid and must be repeated after the COM is repaired and calibration drift criteria met.

### **I. Visible Emissions vs. COM**

While operating at or near maximum production capacity as identified in the permit, conduct visible emissions readings in accordance with 40 CFR 60, Appendix A, Method 9 for a period of not less than two (2) hours. Visible emissions data will be calculated using the average of each 6-minute block average of two (2) certified Method 9 readers (at least one of these readers must be from IDEM-OAM).

During this time, boilers must conduct soot blowing and/or ash pulling on a frequency and duration representative of normal operations. Other processes should use other means to vary the opacity of the emissions; this may be accomplished by altering operations of a PM control device or by ramping of the production rates.

A VE/COM correlation will be considered acceptable and the alternate location approved provided the relative accuracy is ~ 20%. Relative accuracy is based on the absolute value of the mean difference between the readings, the 2.5 % error confidence coefficient and the average of the Method 9 readings or the applicable opacity standard (when the standard is less than 10% opacity). The relative accuracy is calculated as follows:

1. Summarize the results in tabular form, similar to Figure A.
2. Calculate the mean of the Method 9 values and the mean of the opacity values for the same period.
3. Calculate the arithmetic differences between the Method 9 and the COM data output sets.
4. Calculate the mean of the differences, the standard deviation, coefficient and relative accuracy using equations B, C, D and E (respectively).

$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i$$

Equation B

$$s_d = \sqrt{\frac{\sum_{i=1}^n (d_i - \bar{d})^2}{n-1}}$$

Equation C

$$CC = t_{0.975} \frac{s_d}{\sqrt{n}}$$

Equation D

$$RA = \frac{|\bar{d}| + |CC|}{RM}$$

Equation E

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	A	B	A-B	(A-B) <sup>2</sup>
6-min average	Method 9 Average (Reader 1 + Reader 2) / 2	COM 6-min Average		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
Avg.				

II. COM vs. COM

While operating at or near maximum production capacity as identified in the permit, collect 6-minute opacity averages from two (2) COMs. One of these COMs must be at an acceptable location per PS-1 siting criteria and the other should be at the alternative location which the source wants approved.

A COM/COM correlation will be considered acceptable and the alternate location approved provided one of the two following conditions is met:

A. The arithmetic difference between the average 2-hour opacity (calculated as the average of the twenty (20) 6 minute averages) for the two monitors is less than  $\pm 10\%$  of the average reference value.

B. The arithmetic difference between the two average opacity value is less than 2% opacity.

EXAMPLE:

	Approved COM (reference)	Alternate Location COM
Avg. 2-hour Opacity	35%	32%

10% of the reference value is 3.5% opacity and the arithmetic difference between the two values is 3% opacity. As described in Section 4.3 of PS-1, the alternate location is acceptable.

If you have any questions concerning the information provided in this non rule policy document, please contact Ann McIver at (317) 232-8411.

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