

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**Bureau of Air Quality**

**DOCUMENT NUMBER:** 273-4000-004

**TITLE:** Compliance Assurance Policy for Continuous Emission Monitoring Systems (CEMS) on Fluid Catalytic Cracking Units

**EFFECTIVE DATE:** October 1, 2004

**AUTHORITY:** 35 P.S. Sec. 4001-4005 (Air Pollution Control Act) and Act 95 (75 PA C.S. Sec. 4706 (I))

**POLICY:** Prescribes actions for opacity emission and data availability violations on fluid catalytic cracking units

**PURPOSE:**

The purpose of this policy is to establish uniform criteria for assessing monetary penalties for exceedances of emission standards and data availability requirements through agreements rather than criminal citations or civil penalty actions. The Department has found agreements to be effective in resolving violations without resorting to litigation. The benefit of this policy to the source owner is certainty in determining liabilities should violations occur.

**DISCLAIMER:**

The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect different statutory or regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the Department to give these rules that weight or deference. This document establishes the framework, within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

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**COMPLIANCE ASSURANCE POLICY**  
**FOR**  
**CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS)**  
**ON**  
**FLUID CATALYTIC CRACKING UNITS**

**PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**BUREAU OF AIR QUALITY**

**EFFECTIVE OCTOBER 1, 2004**

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## **SECTION 1: GENERAL CONCEPTS**

### I. Scope

A. This policy addresses:

1. Exceedances of visible emission (opacity) standards as indicated from certified Continuous Emission Monitoring Systems (CEMS), and
2. Exceedances of data availability requirements for obtaining such data.

B. The Department reserves the right to take enforcement action beyond that which is specified in this policy for, but not limited to, the following situations:

1. Emission exceedances that would result in imposition of a maximum penalty specified by this policy;
2. Data availability exceedances that would result in imposition of a maximum penalty specified by this policy;
3. Exceedances that demonstrate a chronic pattern;
4. A CEMS which has not been certified or for which certification has been rescinded; or
5. Emissions which result in soiling beyond the property line.

### II. Applicability

A. This policy will apply beginning with the fourth quarter 2004 data.

B. This policy supersedes the "Enforcement Policy for CEMS on Fluid Catalytic Cracking Units" dated July 1986.

C. This policy applies to Fluid Catalytic Cracking Units (FCCU) required to install, maintain, and operate opacity CEMS pursuant to 25 PA Code §123.46.

### III. Purpose

The purpose of this policy is to establish uniform criteria for assessing monetary penalties for exceedances of emission standards and data availability requirements through agreements rather than criminal citations or civil penalty actions. The Department has found agreements to be effective in resolving violations without resorting to litigation. The benefit of this policy to the source owner is certainty in determining liabilities should violations occur.

Source owners are not required to sign a Consent Order and Agreement or a Consent Assessment of Civil Penalty to resolve past or future violations; however, the Department intends to take

criminal and/or civil action to resolve exceedances of standards for which an agreement has not been reached. Generally, a Consent Order and Agreement will be used when corrective steps are required such as operational hardware changes or new CEMS installations. Otherwise, a Consent Assessment of Civil Penalty will be used to settle penalties indicated by this policy. The various leniency factors built into this policy are applicable only to agreement settlements. They have no applicability in adversarial litigation.

IV. Penalties

- A. If violation criteria are exceeded, penalties will be assessed according to the following:
  - 1. Emission violation penalties will be assessed on a daily basis and totaled for the quarter; and
  - 2. Data availability violation penalties will be assessed on a quarterly basis.
- B. The following source factors for FCCU capacities will be applied to all daily emission exceedance penalties and to all quarterly data availability exceedance penalties indicated by the penalty equations in this policy:

<u>FCCU Rated Capacity</u> (barrels/day)	<u>Source Factor, F</u>
< 40,000	1
40,000 - 79,999	2
≥ 80,000	3

- C. Penalty Adjustments
  - 1. The Regional Air Quality Program Manager may forgive a total facility penalty of \$500 or less.
  - 2. Upon receiving adequate documentation from a source owner, the Regional Air Quality Program Manager may make penalty adjustments in accordance with the following:
    - a. Both emission and data availability penalties may be reduced in a multiple unit situation with one CEMS when one or more units are shut down. The source factor will be based upon the rated capacity of the units operating at the time of the violation.
    - b. Data availability penalty adjustments may be made under the following circumstances:
      - i. If a source owner demonstrates compliance with applicable opacity emission standards by alternate means. The amount of the reduction depends on the degree of confidence with which compliance can be demonstrated.

- ii. If the source owner demonstrates that the penalty was due to events or circumstances beyond the control of the source owner. The amount of the reduction depends on the extent to which the situation was uncontrollable.
- iii. If the source owner demonstrates that extraordinary measures were taken to minimize the outage and/or to prevent a recurrence of a similarly caused outage.

A previous data availability problem for which a penalty reduction has been granted may limit or preclude subsequent penalty reductions for similar problems.

- 3. The Chief of the Division of Compliance and Enforcement may adjust any penalty. Requests for such adjustments must be referred through the appropriate Regional Air Quality Program Manager.

## V. Procedures

### A. Quarterly Report Submittals

#### 1. Format

- a. Opacity data reports shall be submitted quarterly in the format specified by the Department during the Phase I review process. The Phase I review process is described in the "Continuous Source Monitoring Manual" (Manual).
- b. Reports not conforming to the format requirements will not be accepted and will be referred to the source owner for resubmission in the proper format.

#### 2. Time Limit

- a. Initial data reports are to be submitted to the Division of Source Testing and Monitoring in Harrisburg within 30 days following the end of each quarter as required in the Record Keeping and Reporting sections of the Manual.
- b. Subsequent data report changes must be submitted to the appropriate regional office. The regional office will forward all approved changes to the Division of Source Testing and Monitoring. Data resubmittals must be submitted to the regional office within 60 days following the end of the quarter.

#### 3. Delinquent Reports

- a. A data report not submitted in the proper format by the time limit indicated in A.2.a. above will be considered delinquent.
- b. A data resubmittal submitted beyond the time limit indicated in A.2.b. above will be considered delinquent.
- c. Delinquent reports will be considered in violation of the reporting requirements specified in the Manual and subject to a penalty of \$100 per day of delinquency per CEMS report. However, this penalty will be forgiven for reports delinquent for seven or less days. That is, the penalty on the eighth day of delinquency would be \$800; on the ninth, \$900, etc.

B. Significant Outages of a CEMS

Continuous periods of data unavailability exceeding 3 days should be reported to the appropriate regional office on the fourth day (or the next working day if the fourth day is on a weekend or a holiday).

## **SECTION 2: VISIBLE EMISSION CEMS PROVISIONS**

### I. Visible Emission Standards

Visible Emission Standards for sources pursuant to 25 PA. Code §123.41 are exceeded if opacity is equal to or greater than:

- A. "20% for a period or periods aggregating more than 3 minutes in any one hour; or"
- B. "60% at any time."

### II. Data Availability Requirements

- A. Opacity monitoring systems are required by 25 PA. Code §139.103 to meet at least one of the following minimum data availability requirements unless other data availability requirements are stipulated elsewhere:
  - 1. At least 90% of the hours in each calendar month shall be valid hours as set forth in the quality assurance section of the Manual.
  - 2. At least 95% of the hours in each calendar quarter shall be valid hours as set forth in the quality assurance section of the Manual.
- B. Definitions and Clarifications
  - 1. A valid hour is defined in the Manual as containing "... at least 75 percent valid data readings" or 45 valid one-minute average opacities.
  - 2. Hours of process downtime and invalid hours caused by Department conducted audits (Level III or IV) will be considered valid hours for this purpose.

### III. Penalty Criteria

#### A. Emission Criteria

In recognition of the potential for some excess emissions during soot blowing, start-up, shutdown, and minor malfunctions, some excess emission times will not be subject to penalty. Adjustments will be made in accordance with the following:

- 1. Up to 1.500% of the operating time in a quarter will be available to reduce excess emission times.
  - a. Up to 5.00% of this adjustment time will be applied to any daily excess emissions of the 60% opacity standard. No more than 15 minutes of adjustment may be applied to any day.



- b. The 95.00% of the adjustment time plus any remaining adjustment time from the 60% opacity adjustments will be applied to any daily excess emission times of the 20% opacity standard. No more than 60 minutes of adjustment may be applied to any day.
- 2. After all adjustments in III.A.1. of this section are made, any remaining excess emission times are subject to penalty assessments.

B. Invalid Data Criterion

Invalid data exceedances will be subject to penalty if more than 10.% of the hours in any month are invalid and more than 5.00% of the hours in the quarter are invalid. If this criterion is met, only those months with more than 10.% invalid hours are considered for penalty assessment.

IV. Penalty Assessment

A. Emission Penalty

- 1. The total daily penalty,  $E_d$ , is the sum of the daily penalties assessed for each of the two opacity standards:

$$E_d = E_{20} + E_{60}$$

- a. For each hour, the excess time when the opacity is between 20% and 100% inclusive,  $t_{20}$ , is considered for penalty assessment. The total daily excess time,  $T_{20}$ , is the sum of all  $t_{20}$ s in that day. That is:

$$T_{20} = \sum_{i=1}^{H_{20}} (t_{20})_i$$

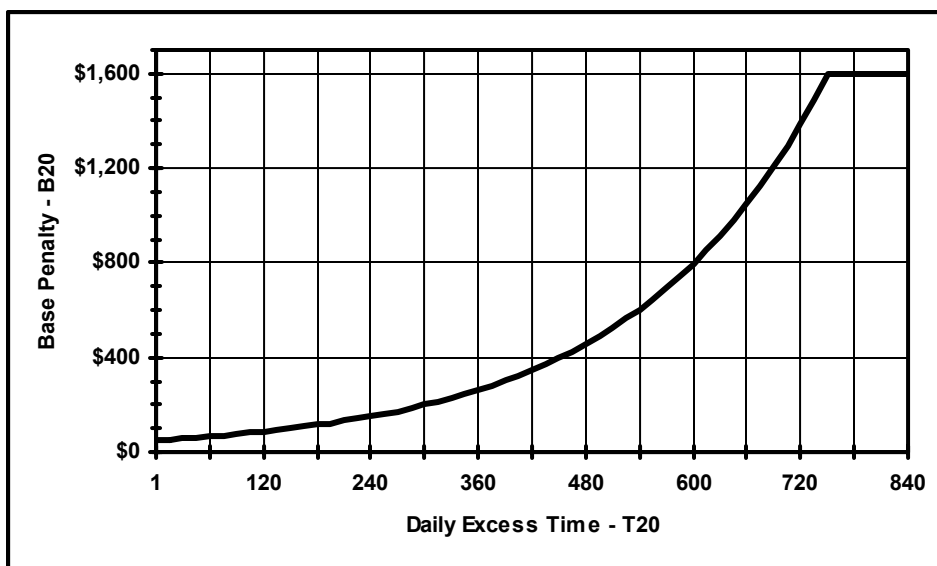
Where:  $H_{20}$  = hours in the day when a 20% opacity exceedance occurred.

$t_{20}$  = minutes, in excess of the 3 allowed, in the  $i^{\text{th}}$  hour when the opacity was between 20% and 100% inclusive.

- i. The base penalty,  $B_{20}$ , is determined from the following equation by this  $T_{20}$ :

$$B_{20} = \$50 \times 2^{\left(\frac{T_{20}-1}{150}\right)} \quad \text{up to a maximum of \$1600} \\ (T_{20} \geq 751 \text{ min.})$$

Graphically that is:



ii. The source factor for size,  $F$ , is applied to this  $B_{20}$  to yield  $E_{20}$ :

$$E_{20} = F B_{20}$$

b. For each hour, the time when the opacity is between 60% and 100% inclusive,  $t_{60}$ , is considered for penalty assessment. The total daily time,  $T_{60}$ , is the sum of all  $t_{60}$ s in that day. That is:

$$T_{60} = \sum_{i=1}^{H_{60}} (t_{60})_i$$

Where:  $H_{60}$  = hours in the day when a 60% opacity exceedance occurred.

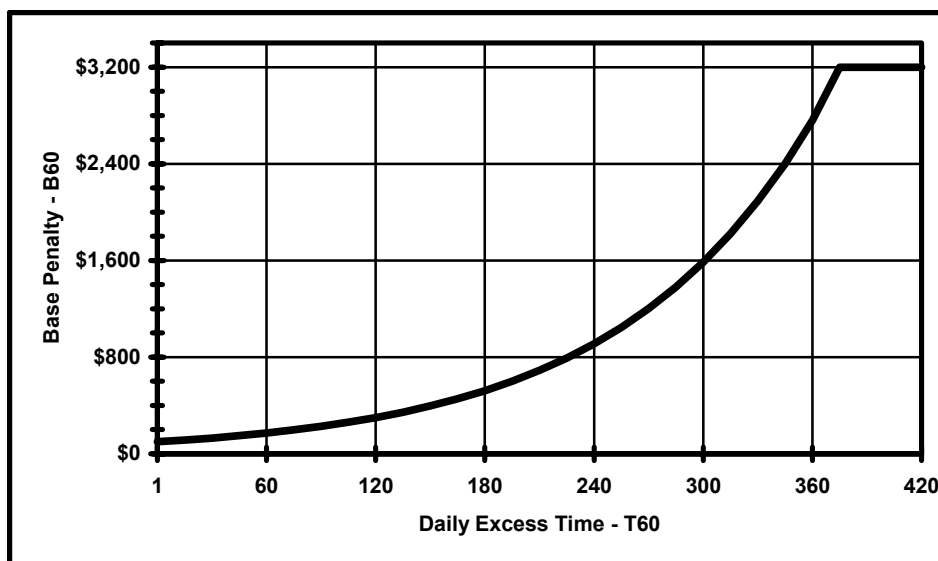
$t_{60}$  = minutes in the  $i^{\text{th}}$  hour when the opacity was between 60% and 100% inclusive.

i. The base penalty,  $B_{60}$ , is determined from the following equation by this  $T_{60}$ :

$$B_{60} = \$100 \times 2^{\left(\frac{T_{60}-1}{75}\right)} \quad \text{up to a maximum of } \$3200$$

( $T_{60} \geq 376$  min.)

Graphically that is:



ii. The source factor for size,  $F$ , is applied to this  $B_{60}$  to yield  $E_{60}$ :

$$E_{60} = F B_{60}$$

2. Penalty Adjustments (for III.A. above)

After all  $E_{60}$  and  $E_{20}$  penalties have been calculated for the quarter, penalty adjustments are made by first adjusting the  $T_{60}$  and  $T_{20}$  times according to the techniques below. Adjusted penalties are then calculated using the adjusted  $T_{60}$  and  $T_{20}$  values.

If during any adjustment, the adjusted penalty is unchanged (i.e. the original excess time is too high for the limited adjustment time to make any differences), the excess time for that day is not adjusted. That is, adjustment times are only applied when the resulting adjusted penalty is reduced.

The total 1.500% adjustment time in minutes,  $A$ , is given by:

$$A = 0.015 (n \times 24 - H_D) 60$$

Where:  $n$  = days in the quarter, and  
 $H_D$  = hours of process down in the quarter.

a. Adjustment technique for  $T_{60}$ s:

The 5.0% adjustment time available,  $A_{60}$ , is given by:

$$A_{60} = 0.05 A$$

Adjustments will be made beginning with the first  $T_{60}$  value in the quarter and will continue chronologically until either the entire adjustment time,

$A_{60}$ , is used or there are no more  $T_{60}$ s to adjust. The 15 minute daily limit applies to all  $T_{60}$  adjustments.

- b. Adjustment technique for  $T_{20}$ s:

The adjustment time available,  $A_{20}$ , is given by:

$$A_{20} = 0.95 A + A'_{60}$$

Where:  $A'_{60}$  = any remaining  $A_{60}$  after adjusting all  $T_{60}$ s.

Adjustments are made beginning with the first  $T_{20}$  value in the quarter and will continue chronologically until either all available adjustment time,  $A_{20}$ , is used or there are no more  $T_{20}$ s to adjust. The 60 minute daily limit applies to all  $T_{20}$  adjustments.

3. The total quarterly emission penalty  $E_q$  is the sum of the daily penalties,  $E_d$ , for all days,  $n$ , in the quarter:

$$E_q = \sum_{d=1}^n E_d$$

## B. Invalid Data Penalties

For each month subject to penalty assessment as defined by the criterion in III.B. of this section,  $N_m$  is the number of invalid hours in excess of the 10% allowed. The sum of  $N_m$ s for all such months,  $M$ , in the quarter is the penalty index sum,  $N_q$ :

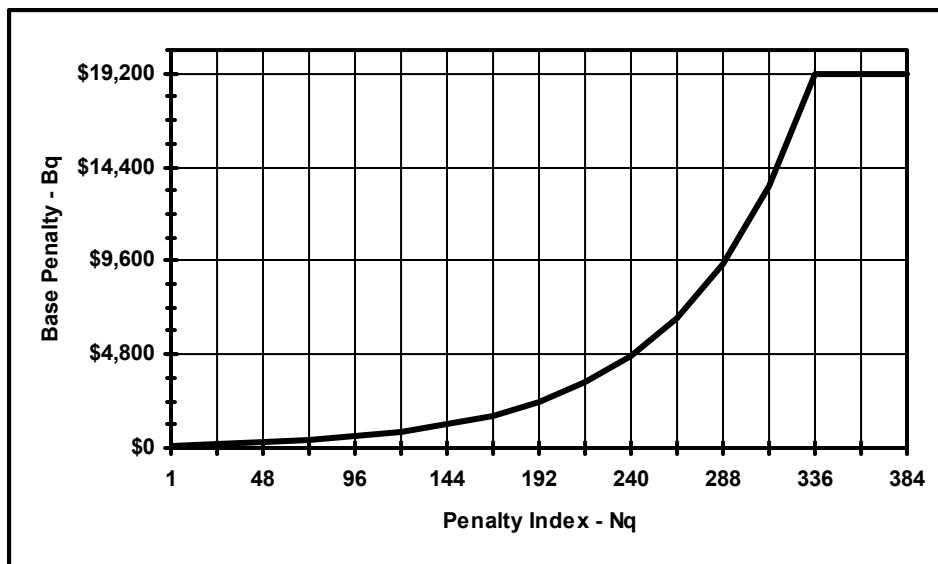
$$N_q = \sum_{m=1}^M N_m$$

1. The quarterly invalid data base penalty,  $B_q$ , is determined from the following equation by this total penalty index,  $N_q$ :

$$B_q = \$150 \times 2^{\left(\frac{N_q - 1}{48}\right)} \quad \text{up to a maximum of } \$19,200$$

( $N_q \geq 337$ )

Graphically that is:



2. The source factor for size,  $F$ , is applied to this  $B_q$  to yield the total invalid data penalty,  $V_q$ :

$$V_q = F B_q$$

- C. The total opacity quarterly penalty,  $P_q$ , is the sum of the emission and invalid data penalties:

$$P_q = E_q + V_q$$

## APPENDIX

### CEMS QUARTERLY REPORT CODING CLARIFICATIONS

Code definitions:

#### Process Down (13)

The process is considered down when there is no liquid feed to the reactor and no soot blowing is occurring in the waste heat boiler.

#### DEP Conducted Audit (22)

Invalid time caused by a Level III or IV audit of the CEMS conducted by DEP.