

Air Quality Permitting Program
Bureau of Technical Services

Technical Manual #1005

Guidelines
for
Continuous Emissions Monitoring Systems (CEMS),
Continuous Opacity Monitoring Systems (COMS),
Periodic Monitoring Procedures (PMPs)
and
Annual Combustion Adjustments (ACAs)

For technical questions on this manual, call:
Bureau of Technical Services at (609) 530-4041

E-mail: **xxxxx.yyyyy@dep.state.nj.us**

Where x – first name
y –last name

New Jersey Department of Environmental Protection

June 1, 2010

TABLE OF CONTENTS

	Page #
I. INTRODUCTION.....	3
II. APPLICABILITY	4
III. DEFINITIONS	5
IV. MINIMUM SPECIFICATIONS FOR CEMS/COMS	6
V. PERFORMANCE SPECIFICATION TESTS	13
VI. QUALITY ASSURANCE (QA) / QUALITY CONTROL (QC).....	15
VII. PREVENTIVE MAINTENANCE.....	16
VIII. CEMS/COMS PERFORMANCE AND EMISSIONS REPORTING.....	17
IX. PROCEDURAL NOTES FOR PMPs	18
APPENDIX A PROTOCOL FOR CONTINUOUS EMISSION MONITORING SYSTEMS...	19
APPENDIX B EEMPR FORMAT.....	22
APPENDIX C NJDEP REGIONAL ENFORCEMENT OFFICE LOCATIONS.....	39
APPENDIX D PROCEDURE FOR THE DETERMINATION OF A THC ALLOWABLE ...	41
APPENDIX E POLICY FOR VALIDATING CEMS DATA AFTER A SIGNIFICANT EQUIPMENT CHANGE	43

I. INTRODUCTION

This manual is not intended to provide step-by-step instructions on designing, selecting, installing or performance testing CEMS/COMS. It contains design specifications, performance specifications, performance test procedures, data storage and reporting requirements, quality assurance criteria, and administrative procedures for obtaining Department approval of CEMS/COMS.

Each proposed CEMS/COMS will be evaluated on an individual basis. No list of approved equipment will be maintained by the Department. Final approval will be contingent upon the system meeting performance and design standards established by the New Jersey Department of Environmental Protection (NJDEP). The standards, while based on those established in the Code of Federal Regulations, have been modified to reflect the specific needs and experiences of the NJDEP. Requests to deviate from the requirements specified in this guideline must have prior written approval from the Bureau of Technical Services. Such requests will be reviewed on a case-by-case basis and must include a sufficient justification. Requests submitted without sufficient justification will not be approved.

The CEMS/COMS approval process consists of four phases: The CEMS/COMS equipment protocol review, the Performance Specification Test (PST) protocol review, PST report review; and the development of a Quality Assurance (QA) and Preventive Maintenance (PM) plan. Specifications for each are included in this manual.

This document also includes methodology guidance for the measurement of emissions within a Periodic Monitoring Procedure (PMP). PMPs may be allowed instead of CEMS and could require Department approval.

If the permit requires the establishment of a Total Hydrocarbon allowable for use with a CEMS or PMP, the procedure found in Appendix D of this document must be followed.

Annual Combustion Adjustments (ACAs) are addressed in the definition section of this document.

(NOTE: Effective June 1, 2010 all CEMS/COMS equipment protocols or revisions and all Performance Specification Test Protocols or revisions shall meet the requirements specified in this guideline).

II. APPLICABILITY

This guideline is intended to be implemented for source operations which are required to install and operate CEMS/COMS for any one or more of the following regulations.

New Jersey Administrative Codes (N.J.A.C.)

- N.J.A.C. 7:26 and N.J.A.C. 7:27

Federal Requirements for Preparation, Adoption and Submittal of Implementation Plans
40 CFR - Part 51;

Federal New Source Performance Standards (NSPS), 40 CFR - Part 60;

Federal National Emission Standards for Hazardous Air Pollutant (NESHAPS), 40 CFR - Part 61;

Federal Acid Rain/Clean Air Markets/NOx Budget Requirements, 40 CFR – Part 75;

Federal Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (RCRA), 40 CFR - Part 264;

Federal Standards for the Management of Specific Types of Hazardous Waste Management Facilities (BIF), 40 CFR - Part 266;

Federal Standards for the Use or Disposal of Sewerage Sludge, 40 CFR - Part 503;

Federal Polychlorinated Bi-Phenyls (PCBS) Manufacturing Processing, Distribution in Commerce and use Prohibitions (TOSCA), 40 CFR - Part 761.

III. DEFINITIONS

1. CEMS (Continuous Emission Monitoring System) - The total equipment required for the determination of a gas concentration or emissions rate. The system consists of the following major subsystems; sample collection and calibration interface, pollutant analyzer, diluent analyzer (if applicable), fuel flow monitors (if applicable), stack gas volumetric flow monitors (if applicable) and data recording and storage devices.
2. COMS (Continuous Opacity Monitoring System) - The total equipment required for the determination of the opacity of emissions which meets the minimum requirements of Performance Specification One of 40 CFR - Part 60 and EPA Proposed Method 203.
3. PMP (Periodic Monitoring Procedure) – The procedure which will be used to gather emissions data at a frequency other than continuous. If required by permit conditions, proposed PMP procedures must be submitted to and approved by the Bureau of Technical Services. Our goal is to not require protocol submittals for PMPs (especially for NO_x, CO and O₂) but some may be necessary. Prior to the posting of any Department approved alternatives on our (BTS) website, the default monitoring (non-reference method) procedure for Nitrogen Oxides (NO_x), Carbon Monoxide (CO) and Oxygen (O₂) shall be EPA Conditional Test Method 034 (CTM-034) which may be found on EPA’s website at <http://www.epa.gov/ttn/emc/ctm.html>. (see Section IX for additional details) The default monitoring (non-reference method) procedure for Volatile Organic Compounds (VOC) and Total Hydrocarbon (THC) may be found on our website at <http://www.state.nj.us/dep/bts/proto.html>.

**Reference method or site specific method testing may be required
as part of any periodic monitoring procedure.**

Please understand that the terms “periodic”, “handheld” and “portable” shall not be considered limiting factors in the determination of an appropriate PMP. For example, even if the terms “periodic” or “handheld” are used in a permit condition, it may be necessary to use a reference method to establish an acceptable PMP.

4. ACA (Annual Combustion Adjustment) - Required by NJAC 7:27-19.7 & 19.16. When conducting a required ACA, the analyzer used to measure concentrations of Nitrogen Oxides (NO_x), Carbon Monoxide (CO) and Oxygen (O₂) shall be capable of meeting the requirements of EPA Conditional Test Method 034 (CTM-034) which may be found on EPA’s website at <http://www.epa.gov/ttn/emc/ctm.html>. The analyzer must be operated, calibrated and maintained in accordance with the manufacturer’s recommendations.

(Note: Definitions of most terms are located in each individual section of each federal rule).

IV. MINIMUM SPECIFICATIONS FOR CEMS/COMS

A. Minimum Requirements

The following list of performance requirements may be applicable to any CEMS or COMS required to be installed by one or more regulations identified in Section II.

1. Opacity
40 CFR - Part 51
Reference Method 203 and;
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 1
2. Sulfur Dioxide (SO₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 2
40 CFR - Part 75 - Appendices A and D
3. Nitrogen Oxides (NO_x as NO₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 2
40 CFR - Part 75 - Appendices A and E
4. Oxygen (O₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 3 (except for those sources effected by BIF only).
40 CFR - Part 75 - Appendix A
5. Carbon Dioxide (CO₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 3
40 CFR - Part 75 - Appendices A and G
6. Carbon Monoxide
40 CFR - Part 60 - Appendix B
Performance Specification Test 4 (MWC are required to meet PST 4A; BIF only Sources required to meet 40 CFR - Part 266).
7. Total Reduced Sulfur (TRS)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 5

8. Continuous Emission Rate Monitors
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 6
40 CFR - Part 75 - Appendix A
9. Hydrogen Sulfide (H₂S)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 7
10. Volatile Organic Compounds (VOC) CEMS
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 8
11. Total Hydrocarbon CEMS
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 8A (except for those sources effected by BIF only).
12. Gas Chromatographic CEMS
Performance Specification Test No. 9
40 CFR - Part 266 and
40 CFR - Part 503
13. Particulate Matter (PM)
Performance Specification Test No. 11
14. Extractive FTIR CEMS
Performance Specification Test No. 15

B. Additional CEMS/COMS Equipment Requirements

In addition to the equipment specifications referenced in Section IV.A., the following equipment specifications will also apply.

1. General Requirements

- a. CEMS/COMS equipment protocol is required to be submitted to the Bureau of Technical Services (BTS) in the format specified in Appendix A. The CEMS/COMS equipment protocol must be approved, in writing (email acceptable), by the Bureau of Technical Services prior to conducting the required Performance Specification Tests (PST). It is recommended that the CEMS/COMS equipment protocol be submitted to and approved by the BTS, prior to the purchase/ordering of such equipment.
- b. The temperature at the exit of the conditioning system for any gaseous CEMS must not exceed 44 °F. This temperature must be continuously monitored and continuously recorded. This may be accomplished by recording the actual temperature or an alarm status. If the conditioner utilizes something other than a chiller to remove moisture, the dew-point of the gas exiting the conditioner must be monitored in the same manner.
- c. Time-sharing of a CEMS with multiple sources is only acceptable in cases where back-up or secondary sources are utilized when primary sources are off-line (non-operational). In such cases, each source must have an independent sample probe and sample transport system.
- d. Any gaseous analyzer installed in a CEMS must have a minimum accuracy, as published by the manufacturer, of plus or minus one percent of the operating range.
- e. For each chemiluminescence based NO_x analyzer, a converter efficiency check must be conducted as the last step of each quarterly audit required by Section VI of this document as well as 40 CFR Part 60 and/or Part 75.
- f. Fuel Flow analyzers must comply with the requirements outlined in 40 CFR, Part 75, Appendix D, Section 2.1.5 (most current version).

2. Calibration Requirements

- a. Calibration Gas Introduction Point - All calibration gases are required to be introduced into the CEMS at the sample probe, no further downstream than the immediate exit of the sample probe.

- b. CEMS calibration is that period of time which occurs once every 24 hours and is to have both high span and zero gases introduced. This period shall be of sufficient duration to demonstrate the required instrument response time, instrument drift and shall include any adjustments (if necessary). If, during any hourly averaging period, the time required to complete the calibration cycle exceeds fifteen (15) minutes for any analyzer, in units of the standard (i.e. ppm at 7% O₂), then that hourly period shall be included in the downtime calculation for that parameter. If the standard requires data from two or more analyzers, the calibration of each analyzer must be completed within the same fifteen (15) minute period. Only one calibration period of less than 15 minutes may be excluded from the downtime requirement for any 24 hour period.
- c. COMS calibration is that period of time, which occurs once every 24 hours and is to include both span and zero filters.
- d. Calibration of all CEMS is to be conducted once every twenty-four (24) hours. This calibration procedure must include the introduction of a high span calibration standard (80% to 90% of operating range) and a zero gas. For oxygen analyzers which can not utilize a true zero gas, a gas standard containing an oxygen concentration no greater than two (2) percent will be allowed. This non-zero oxygen standard must be indicated in the CEMS Equipment Protocol.
- e. Zero gas is required to be introduced first then the high range calibration standard.
- f. Non-methane total hydrocarbon analyzers, if approved for use, must be calibrated with a gas that contains a blend of methane and propane. The methane concentration must be no more than 10 percent of the propane concentration expressed as methane. The propane concentration shall be selected in accordance with item d. above.
- g. All calibration gases must have a minimum certified accuracy of plus or minus two percent of the cylinder label value unless a higher standard is required by regulation.
- h. The quality of the calibration gas is considered an integral part of the CEMS. Accordingly, the quality of the calibration gas utilized, for the daily CEMS calibration, during the certification test program, shall be the minimum quality allowed until the next annual RATA test. Reducing the quality of the calibration gas after the certification program is not acceptable.

3. Data Recording and Storage Requirements

- a. A strip chart recorder is required as a minimum data reduction device for all CEMS/COMS. A minimum chart speed of sixty (60) mm per hour (faster if necessary to insure proper resolution of CEMS data) is required. The Department recommends the use of a Data Acquisition System (DAS) to reduce CEMS data for quarterly Excess Emission and Monitoring Performance Reports (EEMPRs).
- b. Round chart recorders are not acceptable.
- c. All strip chart recorders must automatically record the date along with the CEMS data.
- d. Any computerized Data Acquisitions System (DAS) which is utilized without a strip chart recorder must have the capability of producing historical and present one-minute data averages both visually (on screen) and graphically (hard copy).
- e. One-minute CEMS/COMS data must be retained for a period of one calendar quarter from the date of EEMPR submission. After that date, only applicable averages in units of the standard (example: PPM Hourly average) and all periods of emission exceedences must be stored for the time period specified in the permit.
- f. Data recording and storage equipment upgrades, replacements or repairs do not require a full recertification. The following steps must be taken in addition to any actions required by an applicable regulation.
 - The BTS must be notified of the changes in writing.
 - Upon replacement, the system must be calibrated to demonstrate accurate recording of the data.
 - All calculations performed by the data recording system must be manually verified.
 - It must be documented that all data and storage requirements in the approved equipment protocol remain unchanged.
 - Maintain records of the above and certify in writing that the above items have been successfully completed.

4. Valid Data Capture Requirements

- a. CEMS installed and operating for measurement of gaseous emissions, shall complete a minimum of one (1) cycle of operation, which includes sampling, analyzing and data recording for each successive one (1) minute period.
- b. CEMS must provide a minimum of seventy-five (75) percent [45 minutes] of the one-minute data averages for each one hour (60 minute) clock period.

- c. For any one hour (60 minute) period where less than forty-five (45) minutes of CEMS/COMS data is provided for any analyzer, the entire sixty (60) minute period is considered downtime for that analyzer and shall be included in the quarterly EEMPR as downtime.
- d. All CEMS must provide for a minimum of ninety (90) percent valid data capture of one minute data, in units of the standard, for each calendar quarter, based on source operating time (unless otherwise specified by regulation).
- e. All COMS must provide for a minimum of ninety-five (95) percent valid data based on source operating time for each calendar quarter, based on source operating time (unless otherwise specified by regulation).
- f. Downtime includes those periods where the CEMS or COMS are not providing compliance emission data while the process is in operation. It also includes periods of Quality Assurance (QA) and Preventive Maintenance (PM) procedures and CEMS calibration (if calibration period exceeds 15 minutes in any one hour). All downtime is to be recorded on the quarterly EEMPR form.
- g. If the percent data availability percentage for any CEMS/COMS analyzer cannot be made for two (2) consecutive calendar quarters the facility shall implement the following items:
 - Install a replacement CEMS approved by BTS within one-hundred and eighty (180) calendar days following the end of the second quarter failure.
 - Provide a temporary alternative within thirty (30) days following the end of the second quarter failure to be reviewed and approved by BTS to monitor the compliance status of the emissions source.
 - Items a and b above do not relieve any facility from any permit condition which requires the source to be shutdown in the event of a CEMS failure.
 - Alternatively, and to minimize downtime, the facility may install a replacement in accordance with the policy entitled “**Policy for Validating CEMS Data After a Significant Equipment Change**” included in Appendix E of this document.
- h. If the permit conditions for a given facility allow for startup and shutdown exclusions, calculations of percent valid data capture shall not include the excluded periods.

- i. A small number of permits (most commonly on hazardous waste incinerators) contain conditions which limit or preclude source operations if the CEMS (and/or COMS) is not collecting valid data. Automatic shutdowns required by low oxygen or high carbon monoxide are examples of this type of condition. If this type of permit condition exists, the valid data capture requirements outlined above (items b through f) are not applicable because no downtime is allowed.

5. Stack Gas Volumetric Flow Monitoring

All stack gas volumetric flow measuring devices, required to be installed, shall meet the following requirements:

- a. A differential pressure flow monitor shall have an automatic blow-back purge system.
- b. If a differential pressure flow monitoring device is installed in wet stack conditions, the system shall have the capability for drainage of sensing lines.
- c. The stack gas flow monitoring system shall have the capability for on-line manual transducer calibration and for a zero check.
- d. The stack gas flow monitoring system shall be capable of displaying the individual parameters used in the stack gas flow calculation.

V. PERFORMANCE SPECIFICATION TESTS

- A. A Performance Specification Test (PST) protocol is required to be submitted to and approved by BTS for any CEMS/COMS required by any Federal or State Regulation as well as NJDEP permit conditions.
- B. A full certification (i.e. PST) is required whenever a significant change or repair is made to the monitoring system. The most current version of EPA's "Part 75 Emissions Monitoring Policy Manual" shall be used by the Department to establish the minimum actions for which a full certification will be required. Due to differences in the intended use of the data between Part 75 and a compliance program, the Department may require a full certification for changes and/or repairs when Part 75 does not. It is the facility's responsibility to check with BTS on the need to conduct a full certification. (Also see Item H of this Section below)
- C. The PST protocol must outline the proposed procedures and equipment to be utilized for the certification test program.
- D. PST tests are not to be conducted until after the PST protocol has been approved by BTS.
- E. PSTs shall follow the applicable procedures referenced in Section IV.A., with the following additions:
 - 1. Relative Accuracy (RA) tests shall be conducted during the Calibration Drift (CD) test period. It is recommended that the RA tests be conducted during the latter half of the CD test period.
 - 2. A facility must notify BTS in writing at a minimum of thirty (30) calendar days prior to conducting the PST.
 - 3. The final PST report shall be submitted to BTS within thirty (30) calendar days of completion of the PST.
 - 4. All CEMS/COMS shall successfully complete the PST. The final PST report must be submitted to BTS prior to conducting any compliance stack emission tests. The Department may waive this requirement if the facility provides an appropriate written justification to the Supervisor/CEMS Program.
 - 5. The PST report must include the serial number of each analyzer and data recording device.
 - 6. Each PST report must be certified in accordance with N.J.A.C. 7:27-1.39(a)1 and 2 and must include the certification language specified therein.
 - 7. The report must include RA calculations for raw concentrations as well as units of the standard.
- F. All redundant CEMS/COMS installed to insure the minimum data availability requirement must undergo the appropriate PSTs.

- G. Data from the CEMS/COMS becomes enforceable upon the completion date of the Relative Accuracy portion of a successful certification test program, if the program was conducted in accordance with Section V.E.1., above. Accordingly, the facility shall implement the minimum Quality Assurance/Quality Control procedures, which follow in Section VI, immediately following the successful certification test.

- H. When any integral part of a CEMS is repaired or replaced, and a full certification is required, the facility should consult the policy entitled “**Policy for Validating CEMS Data After a Significant Equipment Change**” included in Appendix E of this document.

VI. QUALITY ASSURANCE (QA) / QUALITY CONTROL (QC)

- A. A QA/QC plan is required to be developed for all CEMS/COMS required in Section II of this document. This QA/QC plan shall incorporate at a minimum those procedures outlined in 40 CFR, Part 60, Appendix F and/or 40 CFR, Part 75, Appendix B for CEMS and those procedures outlined in 40 CFR, Part 60, Appendix B, Specification One and 40 CFR, Part 51, Proposed RM 203 for COMS.
- B. The QA/QC plan shall designate a coordinator for the facility who is responsible to ensure that the QA/QC plan specified in VI.A is implemented.
- C. The QA/QC coordinator shall be responsible for reviewing the QA/QC plan specified in VI.A. on an annual basis. Any changes to the QA/QC plan shall be submitted in writing to the Supervisor/CEMS Program in the Bureau of Technical Services.
- D. All quarterly and annual QA data shall be included in quarterly EEMPR reports and kept on file with the facility. The QA data must be made available upon request.
- E. All procedures outlined in the QA plan specified in Section VI.A above shall commence upon the completion date of the PST.
- F. The Department reserves the right to require the QA/QC plan to be revised at any time based on the results of quarterly EEMPR reviews, inspections, audits or any other information available to the Department.
- G. All redundant CEMS/COMS must undergo the QA/QC procedure specified in the source QA/QC plan specified in Section VI.A.
- H. Quarterly Converter efficiency tests must be conducted on all chemiluminescence based NO_x CEMS at the time of the required quarterly QA/QC procedures included in Item A above and described in Section IV(B)(1)(e).
- I. A CEMS required by permit condition, for the purpose of demonstrating compliance with permit allowables, must be quality assured in accordance with 40 CFR, Part 60, Appendix F. If a facility's CEMS is also required for a Part 75 based program, the Department will accept the Part 75 linearity checks as satisfying the Cylinder Gas Audit (CGA) requirements of 40 CFR, Part 60, Appendix F. However, if for any reason the linearity check is not required by the end of a given quarter (i.e. due to a Part 75 grace period allowance), a CGA must be conducted before the end of the quarter to validate future data for compliance purposes.
- J. Failure to conduct a quarterly audit on a CEMS required for compliance purposes will result in downtime being accumulated beginning on the last day of the quarter in which the facility failed to conduct the audit. Downtime resulting from a failure to conduct a quarterly audit may not be included as allowable downtime in the quarterly report. This may not invalidate the Part 75 data as these rules may allow a grace period and/or data substitution.

VII. PREVENTIVE MAINTENANCE

- A. A Preventive Maintenance (PM) plan must be developed for each CEMS/COMS equipment protocol. The PM plan must include all procedures and/or spare parts necessary to insure the CEMS/COMS data valid capture requirements specified in Section IV.B.4.
- B. The Preventive Maintenance (PM) plan shall be reviewed on an annual basis by the QA coordinator designated in accordance with Section VI.B. Any changes to the PM plan shall be submitted to the Supervisor/CEMS program at the Bureau of Technical Services.
- C. All redundant CEMS/COMS must undergo the preventive maintenance procedures specified in the source PM plan specified in Section VII.A.

VIII. CEMS/COMS PERFORMANCE AND EMISSIONS REPORTING

- A. A quarterly report of CEMS/COMS performance and emission exceedances is required to be submitted to the appropriate Regional Enforcement Office (REO) for the facilities location. The geographic coverage area for each REO is located in Appendix C. This report shall be submitted to the appropriate REO whether or not an emission exceedance has occurred.
- B. The quarterly report specified in Section VIII.A. must be submitted to the REO within thirty (30) calendar days of the end of each calendar quarter.
- C. The format for the quarterly report is included in Appendix B. Approval of any other format shall be made through the REO having jurisdiction over the facility.
- D. CEMS/COMS quarterly reports shall be submitted to the appropriate Regional Enforcement Office for the first quarter in which the CEMS/COMS is installed and for every quarter thereafter.
- E. Certified CEMS/COMS data will be utilized to demonstrate compliance with applicable emission limits or emission standards beginning on the completion date of the successful certification test (see Section V.G.).
- F. Any CEMS/COMS which does not successfully demonstrate that the equipment meets the appropriate PST, after two PST attempts, shall implement the following:
 - 1. Install a replacement CEMS/COMS approved by BTS within one hundred and eighty days (180) calendar date following the rejection of the second PST results.
 - 2. Provide a temporary CEMS/COMS within thirty (30) calendar days that is reviewed and approved by BTS to monitor the compliance status of the source.

IX. Procedural Notes for PMPs

As indicated in Section III of this document, the default monitoring (non-reference method) procedure for Nitrogen Oxides (NO_x), Carbon Monoxide (CO) and Oxygen (O₂) shall be EPA Conditional Test Method 034 (CTM-034). **The analyzer must measure both NO and NO₂.** The default monitoring (non-reference method) procedure for Volatile Organic Compounds (VOC) and Total Hydrocarbon (THC) may be found on our website.

CTM-034 (in section 7.1) defines sample point selection procedures for Reciprocating Engines, Combustion Turbines and Process Boilers. If you are a source other than one of those listed in CTM-034 or you are sampling for VOC/THC, sampling site and points must be selected in accordance with one of the following options.

1. Select a sampling site located at least two stack diameters downstream of any disturbance and one-half stack diameter upstream of the gas discharge to atmosphere. Use a sampling location at a single point near the center of the duct or use the point approved by the DEP.
2. Conduct a stratification check as detailed in EPA Method 7E, Section 8.1.2 and sample at the determined number of points.

Prior to the posting of any Department approved alternative procedures to CTM-034, a process that is able to initially demonstrate stable emissions (less than 10% variability in emissions, through two cycles of CTM-034) will only be required to perform one cycle of CTM-034 for all subsequent monitoring events.

Facilities will be required to use either CTM-034 or a posted approved alternative for Nitrogen Oxides (NO_x), Carbon Monoxide (CO) and Oxygen (O₂).

APPENDIX A

PROTOCOL FOR CONTINUOUS EMISSION MONITORING SYSTEMS AND CONTINUOUS OPACITY MONITORING SYSTEMS

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF TECHNICAL SERVICES

**PROTOCOL FOR CONTINUOUS EMISSION MONITORING SYSTEMS AND
CONTINUOUS OPACITY MONITORING SYSTEMS**

The following is a list of information to be submitted to the Bureau of Technical Services for installation of Continuous Emission Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems (COMS). This information is necessary to evaluate the monitoring system and to determine if it will be acceptable to the Department. Failure to respond to any one item will result in the Department not approving the monitoring system.

- 1) Submit name of manufacturer and model number of each individual analyzer proposed.
- 2) Indicate principal of operation of each analyzer.
- 3) Indicate the range of operation at which each analyzer will be used.
- 4) Indicate the manufacturer and concentration of all calibration standards for each individual analyzer.
- 5) Indicate where calibration standards are introduced into the CEMS or COMS.
- 6) Indicate the calibration schedule proposed for each analyzer.
- 7) Indicate the percentage of valid data captured (or percent downtime) for any calendar quarter, based on source operation time. The facility must agree to the minimum requirements contained in Section IV (B) (4).
- 8) Provide written Quality Assurance practices for each CEMS or COMS.
- 9) Describe the routine maintenance schedule for each analyzer (daily, weekly, monthly, quarterly, yearly).
- 10) Indicate and describe the type of sample transport system, (if applicable).
- 11) Indicate and describe the type of sample conditioning system, (if applicable). Indicate the temperature range (°F) at exit of sample conditioner. Specify if this temperature is continuously monitored and recorded.
- 12) Submit name of manufacturer and model of each data recording device.

- 13) Indicate if the data recorder is a strip chart recorder or data acquisition system (DAS). If a data acquisition system is utilized, it must store one minute data averages and graphically trend one-minute data.
- 14) Indicate the number of parameters (if applicable) the recorder or DAS is monitoring.
- 15) Indicate the speed of the recorder. If no DAS is utilized, provide information on how data will be reduced for excess emission reports, if required.
- 16) Submit a schematic of the source being monitored indicating location of the following items:
 - i.) Sampling point of the monitoring system.
 - ii.) Introduction point of calibration standards.
 - iii.) Placement of the monitor(s).
 - iv.) Placement of the data recorder(s).

The Bureau of Technical Service requests that a copy of the manufacturers original technical specification brochure be submitted along with the listed information.

All correspondence to this office must include the name of the company where the CEMS are to be installed, the program interest number for the facility and the PCP or BOP identification number (permit number). Failure to provide this information can delay the review of the proposed system.

Any questions regarding this information can be directed to:

US MAIL

Mail Code: 380-01A
ATTN: CEMS Coordinator
New Jersey Department of Environmental Protection
Bureau of Technical Services
PO Box 420
Trenton, NJ 08625-0420
(609) 530-4041

SHIPPING ADDRESS

New Jersey Department of Environmental Protection
Bureau of Technical Services
ATTN: CEMS Coordinator
380 Scotch Road
West Trenton, NJ 08628

APPENDIX B

EEMPR FORMAT

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

**EXCESS EMISSIONS AND MONITORING PERFORMANCE REPORT FOR
CONTINUOUS MONITORING SYSTEMS**

This form is to be used for quarterly reporting of the following Continuous Monitoring Systems (CMS):

- Continuous Emission Monitoring Systems (CEMS)
- Continuous Opacity Monitoring Systems (COMS)

The Excess Emission and Monitoring Performance Reports (EEMPRs) are due to the NJDEP regional enforcement office within 30 days of the end of each calendar quarter. This means that the report must be postmarked within this time period.

IMPORTANT: THIS REPORT MUST BE SUBMITTED EVEN IF NO EMISSION EXCEEDANCES OR OTHER PARAMETER VIOLATIONS OCCURRED.

The EEMPR is structured so that a facility with multiple CMSs can submit all the necessary data in one form for each source. Therefore, there may be sections of the EEMPR which ask for information not applicable to the source's monitor operation. If such information is not applicable, please indicate so in the spaces provided.

The EEMPR is composed of four parts:

1. FACILITY AND SOURCE INFORMATION
2. MONITOR INFORMATION
3. SOURCE AND MONITOR DOWNTIME INFORMATION
4. EMISSION EXCEEDANCE INFORMATION

Please submit the computer RATA package and any other information relative to calibration error, yearly performance tests, and other tests and procedures, as required by applicable permit conditions.

In addition, if the facility is required to conduct the following analyzer accuracy assessment tests, please submit the summary page of the results:

For CEMS:

- _____ Relative Accuracy Test Audits (RATA)
- _____ Cylinder Gas Audits (CGA)
- _____ Calibration Error (CE)
- _____ Yearly Performance Test
- _____ Other: specify _____

For COMS:

- _____ Calibration determination error
- _____ Response time determination
- _____ 24 hour zero calibration drift determination

1. FACILITY AND SOURCE INFORMATION

A. Reporting period ending (circle): March 31 June 30 September 30 December 31

Year _____ Number of days in reporting period _____

B. Company Name _____

Mailing Address _____

Plant Location _____

Contact Person _____ Phone _____

Title _____

SOURCE INFORMATION

Source Designation _____

Plant ID # _____ NJ Stack ID # _____ Certificate # _____ Log # _____

Total **SOURCE HOURS OF OPERATION** during reporting period: _____

Type of control device(s) operated _____

C. CERTIFICATION

To be completed by CMS Coordinator (highest ranking official with direct knowledge of the contents of this report):

I certify under penalty of law that the information provided in this document is true, accurate, and complete. I am aware that there are significant civil and criminal penalties, including fines or imprisonment or both, for submitting false, inaccurate, or incomplete information.

Name (Print) _____

Title _____

Signature _____

Date _____ Phone _____

2. MONITOR INFORMATION

A. GENERAL MONITOR INFORMATION	ANALYZER 1	ANALYZER 2	ANALYZER 3	ANALYZER 4
EMISSION OR PARAMETER MONITORED				
MANUFACTURER				
MODEL #				
SERIAL #				
OPERATING RANGE (specify units)				
SPAN LEVEL CALIBRATION				
INSTALLATION DATE				
START UP DATE				
EMISSION/PARAMETER STANDARD (inc. units)				
AVERAGING TIME				
HOURS OF OPERATION				

FINAL DATE OF PST				
DATE OF CERTIFICATION				

B. RELATIVE ACCURACY TEST AUDIT DATA	ANALYZER 1	ANALYZER 2	ANALYZER 3	ANALYZER 4
DATE OF RATA				
REFERENCE METHODS USED (i.e. RM3, etc.)				
AVERAGE RM VALUE				
AVERAGE CEMS VALUE				
ABSOLUTE VALUE OF MEAN DIFFERENCE				
CONFIDENCE COEFFICIENT				
% RELATIVE ACCURACY				

2. MONITOR INFORMATION

C. CYLINDER GAS AUDIT DATA		ANALYZER 1	ANALYZER 2	ANALYZER 3	ANALYZER 4
DATE OF AUDIT					
CYLINDER ID# BY POLLUTANT	HIGH				
	LOW				
EXPIRATION DATE OF ALL CYLINDER GAS CERTIFICATION	HIGH				
	LOW				
TYPE OF CERTIFICATION FOR ALL CYLINDERS	HIGH				
	LOW				
CERTIFIED AUDIT VALUE FOR EACH CYLINDER	HIGH				
	LOW				
CEMS RESPONSE VALUE	HIGH				
	LOW				
% ACCURACY	HIGH				
	LOW				

D. AMMONIA, HCl, AND TOTAL HYDROCARBON MONITORS

CALIBRATION ERROR	HIGH				
	LOW				
CALIBRATION DRIFT	HIGH				
	LOW				
RESPONSE TIME	HIGH				
	LOW				

_____ Check if continued on next page

2. **MONITOR INFORMATION (cont.)**

E. CONTINUOUS OPACITY MONITORS DATA ASSESSMENT

Performance Audit: Date Conducted _____

1. Stack Exit Correlation Error

- a) Actual pathlength correction factor _____
- b) Correct pathlength correction factor _____
- c) Stack Exit Correlation Error _____

2. Active Fault Indicators: error messages present:

3. Zero and Upscale Calibration Check Responses

	Correct Value	Response	Difference
Zero			
Upscale			

- 4. Zero Compensation Value (percent opacity): _____
- 5. Optical Alignment Status: _____
- 6. Dust Accumulation on Optical Surfaces _____

	Initial Opacity	Final Opacity	Difference
Window 1			
Window 2			
Total			

7. Calibration Error

- a) Filter Values (equivalent opacity)
 - Low _____
 - Mid _____
 - High _____

E. CONTINUOUS OPACITY MONITORS DATA ASSESSMENT (cont)

7. Calibration Error (cont)

b) Test Results

	Low	Mid	High
1			
2			
3			
4			
5			

c) Calibration Error

Low _____

Mid _____

High _____

Zero Alignment Audit

1. Clear Path Zero Response _____ % opacity
2. Simulated Zero Response _____ % opacity
3. Zero Alignment Error _____ % opacity
4. Zero Error of Previous Two (2) Assessments _____ _____

3. **SOURCE AND MONITOR DOWNTIME INFORMATION**

	DATE	START OF DOWNTOWN	END	DURATION	REASON	CORRECTIVE ACTION
SOURCE						

TOTAL HOURS OF DOWNTIME

ANALYZER 1 _____						

TOTAL HOURS OF DOWNTIME

ANALYZER 2 _____						

TOTAL HOURS OF DOWNTIME

ANALYZER 3 _____						

TOTAL HOURS OF DOWNTIME

ANALYZER 4 _____						

TOTAL HOURS OF DOWNTIME

CHECK IF CONTINUED ON ADDITIONAL PAGES _____

**INSTRUCTIONS FOR COMPLETING
EXCESS EMISSIONS AND MONITORING PERFORMANCE
REPORT**

1. FACILITY AND SOURCE INFORMATION

- A. Specify the reporting quarter and the year. Include number of days in that quarter.
- B. This information can be obtained from the Certificate to Operate.
- C. The certification statement is written as it appears in N.J.A.C. 7:27-1.39.

2. MONITOR INFORMATION

A. GENERAL MONITOR INFORMATION

Emission or Parameter Monitored - space is provided for four monitor systems. Use additional sheets if necessary. List each analyzer by the emission it is monitoring.

Emission or Parameter Monitored - space is provided for four monitor systems. Use additional sheets if necessary. List each analyzer by the emission it is monitoring.

Manufacture, Model #, Serial #, Operating Range, and Span Level

Calibration - enter this information as it appears on your equipment protocol which was approved by BTS.

Installation Date - the date each monitor was originally installed.

Start-Up Date - the date the system began operating (before the PST).

Emission/Parameter Standard - the permitted allowable emission rate in parts per million or %. Example: CO = 50 ppm. If a stack gas flow meter is installed and properly operating and has been approved by BTS, the emission allowable may be reported in lbs/hour if required by Certificate.

Averaging Time - as appears in conditions of the permit/certificate. It will be rolling or block averages as defined below. Block averaging may be requested in writing from BTS.

Hourly Rolling Averages - The CEMS shall calculate every minute, an hourly rolling average, which is the arithmetic mean of the 60 most recent 1-minute average values.

Block Averaging - For averaging times of one hour or greater, block averaging will be used to measure the average beginning on the hour. For parameters with averaging time of less than one hour, averaging will measure the parameter by beginning on the hour and continuing by subsequent increments of the parameters averaging time.

Hours of Operation - the total number of hours the CEMS operated while the source was in operation for the reporting quarter.

Date of PST - Report the date of the last day of the successful test.

Date CEMS Certified - date of the completion of a successful PST.

B. RELATIVE ACCURACY TEST AUDIT DATA

Obtain this information from the audit results which will include calibration gas certification, reference methods, calculations, etc. Include copy of the Summary Sheet from RATA. The RATA must be conducted at least once every four calendar quarters.

C. CYLINDER GAS AUDIT DATA

Obtain this information from the Cylinder Gas Certificate and the Audit Summary Sheet. See 40 CFR Part 60 Appendix F for CGA procedures. Include a copy of the Summary Sheet from the CGA. The CGA may be conducted in three of four calendar quarters, but in no more than three quarters in succession.

D. OPACITY ANALYZER ACCURACY ASSESSMENT

Report the month, day and year of the quarterly audit. Refer to CFR Part 51 Method 203 to complete Sections 2 through 7.

3. SOURCE AND MONITOR DOWNTIME INFORMATION

A. Source is considered to be down when no contaminants are being emitted or generated by any source operation or the control equipment. Only those periods of unscheduled downtime such as periods when the source or control device is non-operational due to equipment failure or malfunction should be reported. Do not report that time when the source is inactive due to regularly scheduled downtime such as holiday vacation or after-hours shutdown periods.

B. Analyzer downtime is any time the monitors are not collecting and recording valid emission data while the source or control device is operating. This includes daily calibrations which exceed 15 minutes in any one clock hour, Appendix F QA/QC activity (i.e., RATA, CGA, RAA), monitor out-of-control periods as defined in 40 CFR Part 60 Part 60 Appendices B & F, and normal or preventative maintenance.

(Note: Definition of analyzer downtime is in the EEMPR Definitions section).

Any CEM downtime which exceeds 15 minutes shall be deemed down for the entire hour, for block averages; CEM downtime for rolling averages must be reported in minutes.

Downtime of any diluent analyzer used in conjunction with an emission analyzer shall result in both analyzers being considered down until that time when both (or all) analyzers are operating simultaneously.

4. EMISSION EXCEEDANCE INFORMATION

INSTRUCTIONS FOR REPORTING EXCEEDANCES

COLUMN	EXPLANATION
1	Enter the date the exceedance occurred.
2	Enter the monitored emission or parameter which was exceeded.
3	Enter the permit allowable emission concentration limit of the emission or parameter listed in Column 2. Example: For a 2 hour period beginning 12:00 and ending 14:00, the average concentration of NO_x in the stack gas was 400 ppmvd at 13:00 and 14:00, exceeding the permit allowable limit of 300 ppmvd @ 7% O₂. Enter 300 in Column 3.
4	Enter the units of measurement for the contaminant or parameter, as listed in the permit. For opacity, enter [OPACITY]. For the example listed in #3 above, enter “ppmvd” in Column 4.
5	Enter the averaging time allowed by the permit for the emission or parameter listed in Column 2, if applicable. For the example given in #3 above, enter 1:00.

6 **If the emission has a block averaging time:** The start time is the beginning of the averaging period showing the exceedance, and the end time is the end of that averaging period. If the total exceedance time is greater than the averaging time, it will require separate line item entries on the EEMPR. Use military time.

For the example given in #3 above, on one line, enter 12:00 in the “START” column and 13:00 in the “END” column; on the following line, enter 13:00 in the “START” column and 14:00 in the “END” column.

If the emission has a rolling averaging time: Enter the time (“START”) it exceeded the permit allowable, and the time (“END”) it returned to the permit allowable limit.

For the example given in #3 above, on one line, enter 12:00 in the “START” column and 14:00 in the “END” column.

7 **If the emission has a block averaging time:** Enter the averaging time, in decimal hours.

For the example given in #3 above, enter 1.0 as the duration for each of the one hour exceedances.

If the emission has a rolling averaging time: Enter the total time that the rolling average exceeded the permit allowable, in decimal hours.

For the example given in #3 above, enter 2.0 as the duration for each of the one hour exceedances.

8 **If the emission has a block averaging time:** Enter the total time that the rolling average exceeded the permit allowable, in decimal hours.

For the example given in #3 above, enter 2.0 as the duration for each of the one hour exceedances.

If the emission has a rolling averaging time: Enter the average emission exceedance for the duration of the incident, in decimal hours.

For the example given in #3 above, enter the average exceedance in Column 8.

For OPACITY, see REPORTING OPACITY EXCEEDANCES below.

9 **For all emission exceedance except oxygen and opacity:** Enter the percent over the permit allowable using the following formula:

$$\frac{\text{Column (8)} - \text{Column (3)}}{\text{Column (3)}} \times 100\%$$

For minimum oxygen concentration exceedances: Enter the percent of the minimum oxygen concentration using the following formula:

$$1 - \frac{\text{Column (8)} - \text{Column (3)}}{\text{Column (3)}} \times 100\%$$

For opacity: enter N/A

10 Enter any remarks relating to the reported exceedance, such as cause or remedial action.

REPORTING OPACITY EXCEEDANCES

Reporting Opacity Exceedances for Sources NOT regulated by NJAC 7:27-3

Provisions in this Technical Manual 1005, concerning "No Visible Emissions (NVE)", supersede any DEP Technical Manual, including Manual #1410, page 9, which may have established NVE to mean anything other than: opacity not greater than 5 percent.

Opacity is required to be measured by a six minute averaging method; an emission exceedance is said to have occurred after the six minute average value exceeds the permit allowable. A continuous opacity exceedance is an incident in which consecutive six minute average readings are greater than the permit allowable. Such an incident should be reported in the form of six minute block averages (i.e., separate line item entries for each six minute average).

Example: A cogeneration plant subject to the opacity provisions in its permit cannot exceed 10% opacity in any 6 minute block period. From 15:03 to 15:33, the six minute average opacity readings from this source were 12%, 20%, 35%, etc.

On one line of the EEMPR:

In Column 5, enter 00.06.

In Column 6, enter 15:03 in "START", and 15:09 in "END".

In Column 7, enter 0.1 (6 minutes /60 minutes)

In Column 8, enter 12%, the six minute average for the first six minutes of the exceedance.

On the subsequent lines, enter the next 6 minute averages which exceed the limit.

Procedure for Determining Compliance With NJAC 7:27-3 Opacity Limits Utilizing Continuous Opacity Monitoring Systems (COMS)

The following describes the procedure for determining compliance with the opacity limits specified in NJAC 7:27-3. "Control And Prohibition of of Smoke From Combustion of Fuel" when a Continuous Opacity Monitor System (COMS) is utilized.

◆ Opacity Standard

The following are the opacity standards for NJAC 7:27-3:

Section 3.2(a) – No Visible Emissions

Section 3.2(b) - 20 %

Section 3.3(a) - 20 %

Section 3.4 - 40%

Section 3.5 - 20%

For any emission unit regulated by NJAC 7:27-3.2(a), for which the opacity limit is described as **No Visible Emissions (NVE)**, NVE is deemed to be opacity not greater than five (5) percent.* Any opacity minute where the opacity reading is greater than 5 % determined by the use of a COMS, will be a violative minute of an NVE limit.

- As per February 4, 1988 memo from Donald Patterson

◆ Compliance Period

The averaging period in which to determine compliance with the opacity limit , utilizing a COMS, in

this subchapter, is a thirty (30) minute block average that is based on the clock hour.
(Example: 12:01 to 12:30, 1:31 to 2:00, ect)

◆ **Compliance Procedure**

The emission unit is allowed three (3) minutes in this 30 minute block, where the opacity from an emission source can exceed the opacity limit. The 3 minutes of violative opacity do not have to be consecutive, but anywhere in the 30 minute block. Upon the emission unit having a fourth minute of violative opacity (over the specified opacity limit) in the 30 minute block, the emission unit would be considered in violation of the particular opacity limit.

◆ **Compliance Procedure (cont'd)**

For documenting a violation in NJEMS, if the emission unit exceeds 3 minutes of opacity, over the opacity standard then the entire 30 minute block would be included in NJEMS as the period of violation.

◆ **Penalty Determination**

The highest opacity reading that occurred in the 30 minute block, would be included in NJEMS for determining the magnitude of the violation. The highest reading would be considered for all the opacity readings that occurred during the 30 minute block, including the 3 minutes that were initially excluded as part of the compliance determination. The compliance period allows 3 minutes to be excluded in the 30 minute block. But for penalty consideration the highest reading overall during the block, including the 3 minutes excluded, is used for the penalty determination.

DEFINITIONS

Definitions of most terms are located in each individual section of each Federal rule.

CEMS (Continuous Emission Monitoring System) - The total equipment required for the determination of a gas concentration or emission rate. The system consists of the following major subsystems; sample collection and calibration interface, pollutant analyzer, diluent analyzer (if applicable) and data recorder/acquisitions system.

COMS (Continuous Opacity Monitoring System) - The total equipment required for the determination of the opacity of emissions which must meet the minimum requirements of Performance Specification One of 40 CFR - Part 60 and 40 CFR Part 51 - Reference Method 203.

EXCESS EMISSIONS - A period of time during which emissions of a regulated pollutant at a given source exceed the limit in units of the standard as specified in the conditions associated with the applicable permit and/or regulation.

DOWNTIME - The period of time when the source is producing emissions which are monitored by the CEMS/COMS but the monitors and/or recorders are not providing valid compliance emission data. This includes periods of Quality Assurance (QA) and Preventative Maintenance (PM) procedures, CEMS Calibration (Cal) that exceed 15 minutes in any one hour. (See definitions of Rolling and Block Averaging on Page 2 of the Instructions for Completing the EEMPR).

SOURCE - The production equipment and/or control equipment attached to and serving the production equipment for which the CEMS/COMS are monitoring emissions data.

APPENDIX C

NJDEP REGIONAL ENFORCEMENT OFFICE LOCATIONS

AIR COMPLIANCE AND ENFORCEMENT REGIONAL OFFICES

CENTRAL REGIONAL OFFICE

22 South Clinton Avenue
4 Station Plaza
P.O. Box 420
Trenton, NJ 08625-0420

Phone No. (609) 292-3187 Fax No. (609) 292-6450

COUNTIES: Burlington, Mercer, Middlesex, Monmouth, and Ocean

NORTHERN REGIONAL OFFICE

7 Ridgedale Avenue
Cedar Knolls, NJ 07927

Phone No. (973) 656-4444 Fax No. (973) 656-4080

COUNTIES: Bergen, Essex, Hudson, Hunterdon, Morris, Passaic, Somerset, Sussex, Union and Warren

SOUTHERN REGIONAL OFFICE

One Port Center
2 Riverside Drive
Camden, NJ 08162

Phone No. (856) 614-3601 Fax No. (856) 614-3613

COUNTIES: Atlantic, Camden, Cape May, Cumberland, Gloucester and Salem

APPENDIX D

Procedure for the Determination of a THC Allowable

General Procedure for Establishing PPM Allowables for Oxidizers

General Statements

This document establishes a procedure by which THC results obtained during compliance stack testing of an oxidizer can be correlated to concurrent THC CEM or Periodic Monitor data and extrapolated to identify a not-to-exceed THC CEM or Periodic Monitor value. This value is then utilized for on-going compliance assurance. The procedure is designed to establish an allowable ppm value based on the minimum allowable destruction efficiency (DE). THC or Periodic Monitor values correlated to compliance test results obtained at higher than the allowable DE will be normalized to the allowable DE (usually 95.0%).

The THC CEM or Periodic Monitor must be installed, operational and properly calibrated (in accordance with EPA Method 25A) prior to and during the compliance test program so that measured concentration values may be compared with the compliance test data.

This procedure produces a calculated maximum THC CEM or Periodic Monitor value that would correspond to an oxidizer destruction efficiency of 95.0%. Operation at or near this calculated maximum value while at lower than tested production levels may be indicative of a failure to achieve the required minimum destruction efficiency. However, mass emissions (lbs/hr) should still be in compliance for this scenario.

In addition to providing a continuous demonstration of compliance with the Worse Case Outlet Allowable, the source will acquire real-time data to facilitate proactive maintenance procedures on their control device. This procedure should be used each time a compliance test is required, and the allowable reset as necessary.

Calculation Procedure

WCOA	= Worse Case Outlet Allowable (PPM)
TIPPH	= Tested inlet pounds per hour
TOPPH	= Tested outlet pounds per hour (= TIPPH*[1-TDE])
MAOPPH	= Maximum Allowed outlet pounds per hour (= TIPPH * [1 – MADE])
TDE	= Tested Destruction Efficiency (expressed as a decimal fraction, ie: 0.950 for 95.0% DE)
MADE	= Minimum allowed DE (usually 95.0%...decimal 0.950)
MOPPM	= Measured outlet ppm from <u>calibrated</u> THC CEM or Periodic Monitor <u>during</u> the DE test.

$$\text{WCOA} = \frac{\text{MOPPM} \times [\text{MAOPPH}]}{\text{TOPPH}}$$

$$\text{WCOA} = \frac{\text{MOPPM} \times [\text{TIPPH} * (1 - \text{MADE})]}{\text{TIPPH} * (1 - \text{TDE})}$$

Substituting and assuming MADE = 0.950

$$\text{WCOA} = \frac{\text{MOPPM} \times \text{TIPPH} \times (1-0.950)}{\text{TIPPH} \times (1-\text{TDE})}$$

FINAL EQUATION for MADE = 95%

$\text{WCOA} = \frac{\text{MOPPM} \times 0.050}{(1-\text{TDE})}$
--

APPENDIX E

Policy for Validating CEMS Data After a Significant Equipment Change

Policy for Validating CEMS Data After a Significant Equipment Change (02/03/03)

A facility that desires to make a modification to a CEMS is required to do the following:

1. Notify BTS of the proposed change.
2. Submit details of the modification to BTS in the form of an amendment to the CEMS Equipment Protocol.
3. If BTS review indicates the CEMS modification is significant enough to warrant a recertification, the facility will be required to schedule a mutually acceptable date to conduct a PST.

Option 1. Upon completion of the installation of the new equipment, the facility is required to conduct a cylinder gas audit (CGA) as per 40, CFR Part 60, Appendix F. The Period of time beginning with the removal from service, or failure of the existing CEM, to the completion of a successful CGA shall be considered downtime. Upon successful completion of the CGA, daily calibration drift test determinations will be required in accordance with 40 CFR, Part 60, Appendix F. If the daily calibration drift continues to comply with the QA provisions of 40 CFR, Part 60, Appendix F, the data will be considered valid on a contingent basis.

The facility will have a maximum of 30 days, following the failure or removal from service of the old equipment, to conduct a Performance Specification Test (PST), including a seven day drift test and a relative accuracy test. If the CEMS meets the requirements of the CEMS respective performance specification on the first attempt, the CEMS data will be considered valid retroactive to the successful CGA. (This retroactive approval is contingent upon all calibrations drift tests leading up to the Performance Specification Test meeting the minimum requirements of 40 CFR Part 60 Appendix F.

If the facility fails to conduct a daily calibration drift test **or** if the daily calibration drift test fails to meet the requirement of 40 CFR Part 60 Appendix F, the CEMS data from the point of drift failure back to the equipment's installation will be considered invalid and be counted as downtime, and will continue so until a successful PST has been completed.

Option 2. As an alternative, if the relative accuracy test is conducted within seven days of installation of the new CEM, the data recorded from the start of a successful seven-day calibration drift test will be considered valid. This is contingent upon the relative accuracy being performed during the seven day test period **and** its meeting the performance test requirements on the first attempt. Under this option, the period of time beginning with the removal from service, or failure of the existing CEM, to the beginning of a successful seven-day calibration drift test (that includes a successful relative accuracy test) shall be considered downtime. (Under this second option the source would not be required to validate data via a CGA during the seven-day drift test.)