UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR - 1 2004

Mr. Boyd A. Giles
Authorized Account Representative
MeadWestvaco Corporation
P.O. Box 940
Phenix City, Alabama 36868-0940

Re: Request for Approval of a Predictive Emissions Monitoring System for a PFI Boiler
(Unit Z008) at the Mahrt Paper Mill (Facility ID (ORISPL) 54802),

Dear Mr. Giles:

This is in response to your April 30, 2003 petition under §75.66 (d) and 40 CFR Part 75, Subpart E, as amended on May 5, July 25, and July 31, 2003, in which MeadWestvaco Corporation (MeadWestvaco) requested approval of a predictive emissions monitoring system at a gas-fired, pressurized furnace industrial (PFI) boiler located at its Mahrt Paper Mill in Cottonton, Alabama. EPA approves the petition, with conditions, as discussed below.

This response also amends paragraphs (a) and (h), and section 6 of the petition approval dated January 28, 2003 for the predictive emissions monitoring system installed on the combustion turbine (Unit X022) at the Mahrt mill (see "Amendment to the January 28, 2003 Petition Response", below).

Background

On April 30, 2003, MeadWestvaco petitioned for approval of a *Software CEM®* predictive emissions monitoring system (PEMS) manufactured by Pavilion Technologies. The PEMS is a neural network-based computer software system that utilizes computerized boiler sensor inputs to predict nitrogen oxides (NO_x) emissions. The PEMS is installed on a 428 mmBtu/hr, Babcock and Wilcox dry bottom, wall-fired steam boiler (Unit Z008) at the Mahrt Paper Mill in Cottonton, Alabama. Unit Z008 is used to produce steam for the mill. The primary fuel for the unit is pipeline natural gas and the secondary fuel is No.2 fuel oil. The unit has no emission controls for NO_x. Unit Z008 is subject to the NO_x Budget Trading Program under Alabama Department of Environmental Management (ADEM) Code R. 335-3-8. Code R. 335-3-8 requires MeadWestvaco to begin monitoring and reporting NO_x mass emissions and heat input for Unit Z008 by May 1, 2003. The selected NO_x mass monitoring methodology must meet the requirements of Subpart H of Part 75. Pursuant to discussions with MeadWestvaco, EPA agreed that installation of the PEMS, completion of initial certification testing of the PEMS, and submission of a petition for approval of the PEMS as an alternative monitoring system (AMS) under Subpart E of Part 75 by May 1, 2003 would effectively satisfy these requirements.

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Under Subpart E of Part 75, the owner or operator of a unit applying to the Administrator for approval of an AMS must demonstrate that the AMS has the same or better precision, reliability, accessibility, and timeliness (PRAT) as provided by a CEMS. The demonstration must be made by comparing the AMS to a contemporaneously operating, fully certified CEMS or EPA reference test methods. Sections 75.41 through 75.46 discuss the criteria for evaluating PRAT, and describe the requirements for daily quality assurance and missing data substitution for the AMS. Section 75.48 details the information that must be included in the application in order to demonstrate that the criteria in §§75.41 through 75.46 are met.

The *Software CEM®* system was installed on Unit Z008 in January, 2003. MeadWestvaco subsequently hired a contractor to perform EPA Reference Method (RM) testing for NO_x concentration (ppmvd, using RM 7E), O_2 concentration (dry % O_2, using RM 3A) and the resulting NO_x emission rate (lb/mmBtu, calculated using Equation F-5 in Appendix F of Part 75). The testing was conducted at normal representative unit operating levels while the boiler combusted pipeline natural gas. The testing produced 850 valid, hourly paired RM and PEMS values. On April 30, 2003, MeadWestvaco submitted a petition for approval of the PEMS, as required.

EPA's Determination

The following paragraphs describe how EPA determined that MeadWestvaco's application satisfies the requirements of a Subpart E AMS petition, and is therefore approvable. The conditions of EPA's approval are also stated. As discussed in greater detail below, EPA's approval applies only to steam boiler Unit Z008, and only to the PEMS output of NO_x emission rate (lb/mmBtu).

1. Precision

Under §75.41, for the normal unit operating level, the owner or operator must provide concurrently-recorded, paired hourly data from the AMS and from a fully certified CEMS or a reference method for at least 90 percent of the hours during a period of 720 (or more) unit operating hours while the unit is combusting its primary fuel. Missing data substitution procedures must not be used during the 720-hour period. The owner or operator may adjust the data to account for any demonstrated lognormality and/or time dependency autocorrelation. The data must pass three statistical tests, i.e., a linear correlation coefficient test, where "r" must be ≥ 0.8, an F-test, and a one-tailed t-test for bias, as described in §7.6 of Appendix A to Part 75. Further, two separate time-series plots must be prepared for the AMS and CEMS (or RM) data. Each data plot must have a horizontal axis representing the clock hour and calendar date of the readings and must contain a separate data point for every hour for the duration of the test period. One data plot must show percentage difference vs. time, and the other data plot must show AMS and CEMS readings vs. time. Finally, a plot of the paired AMS (on the vertical axis) and CEMS (on the horizontal axis) data must be provided.

MeadWestvaco collected 917 hours of historical, paired RM vs. PEMS data while natural gas was being combusted in Unit Z008. Data from 65 hours during this time period was invalidated due to various problems unrelated to PEMS performance. Therefore, 852 hours of valid paired RM and PEMS data were collected. Only 850 hours of valid data submitted to EPA. However, as

2

explained in a July 23, 2003 letter (submitted in a July 25, 2003 e-mail) from MeadWestvaco's testing company, Advanced Industrial Resources, Inc., inclusion of these two hours of data does not significantly affect the test results. According to MeadWestvaco, the 850 hours submitted represent more than 90% of the unit operating hours in the data collection period, thereby satisfying the requirement in §75.41(a)(6). According to MeadWestvaco, all 850 hours of data were quality-assured, i.e., no missing data substitution procedures were applied.

The table below shows the results of the statistical tests for the conditionally approved PEMS output.[1]

PEMS (lbs NO_x/mmBtu)
t-test: mean difference d = 0.0325 abs. value of confidence coefficient cc = 0.0017 **Evaluation:** Since $\lvert cc \rvert < d$, the model failed.[2] **BAF** = $1 + \lvert d_{avg} \rvert$ / $PEMS_{avg}$ = 1.161
r-coefficient correlation: r = 0.951 **Evaluation:** Since $r \geq 0.8$, the model passed.
F-test: variance of PEMS = 0.006818 variance of RM = 0.006542 F = 1.042 $F_{critical}$ = 1.12 **Evaluation:** Since $F_{critical} \geq F$, the model passed.

The PEMS output of NO_x emission rate in lb/mmBtu passed the r correlation and F-test, but failed the t-test for bias. Therefore, a bias adjustment factor (BAF) was calculated according to Part

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[1] Under §75.41(b), in preparation for conducting the required statistical tests, the data may be screened for lognormality and time dependency autocorrelation. If either is detected, certain calculation adjustments are allowed. According to MeadWestvaco, no lognormality was detected. Although the data set met the autocorrelation criteria, application of the time dependent autocorrelation test is not appropriate for this data set since the hourly averages are influenced by drastic boiler load changes. Even if an autocorrelation adjustment was applied, the adjusted data set would not have been significantly affected. Therefore, consistent with §75.41(b), no calculation adjustments were made to the data.

[2] If the t-test is failed, the PEMS must apply a bias adjustment factor (BAF) as described in Part 75, Appendix A, §7.6.5.

75, Appendix A, §7.6.5. This BAF shall be applied to the PEMS output until the next relative accuracy test audit (RATA), at which time a new BAF will be determined if the t-test is failed (see paragraphs (f), (g) and (h)).

Further, MeadWestvaco supplied the appropriate data plots concerning the paired AMS and CEMS data under §§75.41(a)(9) and (c)(2)(i).

2. Reliability

According to §75.42, the owner or operator must demonstrate that the PEMS is capable of providing valid hourly averages for 95.0 percent or more of unit operating hours over a one-year period, and that the system meets the applicable quality-assurance requirements of Part 75, Appendix B. The April 30, 2003 petition states that because the PEMS was installed in January 2003, insufficient time has passed to meet this requirement. However, upon completion of the first operating year, commencing on February 24, 2003, MeadWestvaco has agreed to provide the required reliability information to EPA for review. EPA therefore finds that the PEMS conditionally meets the §75.42 requirements for monitoring system data availability. Section 4, below discusses the PEMS' status with respect to the applicable Appendix B quality assurance and quality control (QA/QC) requirements.

3. Accessibility and Timeliness

According to §§75.43 and 75.44, the owner or operator must demonstrate that the PEMS: meets the recordkeeping and reporting requirements of Subparts F and G of Part 75; can provide "a continuous, quality assured permanent record of certified emissions data on an hourly basis"; and is capable of "issuing a record of data for the previous day within 24 hours". According to MeadWestvaco, the PEMS has demonstrated the ability to meet Subpart F and G requirements by employing a DAHS that generates monitoring data in accordance with EPA's electronic data reporting (EDR) format, version 2.2. The software also provides a continuous display of real-time emissions data to the operator. In view of these considerations, EPA finds that the PEMS meets the requirements of §§75.43 and 75.44.

4. Quality Assurance

To quality-assure the data recorded by a PEMS, Subpart E requires the following: First, under §75.45, the owner or operator must demonstrate either that daily QA tests equivalent to those in Appendix B of Part 75 can be performed on the PEMS or that such tests are unnecessary for providing quality-assured data. Second, §75.48(a)(9) requires the owner or operator to submit as part of the certification application a detailed description of the operation, maintenance, and quality assurance procedures for the AMS as required in Part 75, Appendix B. Third, §§75.48 (a)(8), (a)(10) and (a)(11) require the owner or operator to provide: a detailed description of the process used to collect data, including location and method of ensuring an accurate assessment of operating hourly conditions on a real-time basis; a description of methods used to calculate heat input or diluent gas concentration; and results of tests and measurements necessary to substantiate the equivalency of the AMS to a fully certified CEMS.

EPA finds that the quality assurance/quality control description provided by MeadWestvaco

in Section 4.3, Appendix C of the petition demonstrates a willingness to comply with the requirements of Subpart E. The elements of Section 4.3 are patterned after the certification requirements approved for the PEMS on MeadWestvaco's combustion turbine (see EPA petition response dated January 28, 2003). Nevertheless, there are some differences between the QA procedures for the combustion turbine and the PFI boiler. In view of this, to avoid any possible misunderstanding, the exact certification and QA requirements for Unit Z008 are itemized in paragraphs (a) through (j), below:

(a)   For all unit operating hours (except for the conditions described in paragraph (i)), the PEMS input parameters listed in the Table immediately below shall be used, unless the PEMS is retrained according to paragraph (h) below, in which case, any new PEMS input parameters will supersede the parameters in the Table (referred to as the "PEMS operating envelope"). The input parameters include natural gas flow, oxygen concentration, number of burners fired, and absolute humidity. The PEMS input parameters must stay within the minimum and maximum values (inclusive) in the Table, unless the PEMS is retrained according to paragraph (h) below, in which case, the new training values will supersede the values in the Table. If any PEMS input parameter value goes below the minimum or above the maximum table values by 5 percent or more, the PEMS shall be considered out-of-control, and the maximum potential NO_x emission rate (MER) shall be used, calculated according to paragraph (i), starting with the hour after the sensor value goes outside of the PEMS operating envelope and ending with the hour after the sensor value is back within the PEMS operating envelope. Data from each PEMS input parameter shall be maintained on site in a form suitable for inspection for at least three (3) years from the date of each record.

PEMS Operating Envelope

PEMS Input Parameter	Minimum Value	Maximum Value
Natural gas flow (kscfh)	1.51	341.65
O_2 (%)	0.10	21.13
Number of burners fired	1	4
Absolute humidity (grains H_2O/lb dry air)	0.00	140.00[3]

(b)   The sensors for the PEMS' input parameters must be maintained in accordance with the manufacturer's recommendations. Further, the PEMS must have a sensor validation system which identifies and reconciles failed sensors, by comparing each sensor to several other sensors and determining, based on the comparison, if a sensor has failed, and then calculating a reasonable substitute data value for the parameter

5

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[3]   The PEMS precision test data has a maximum absolute humidity of 120.7 grains of water per pound of dry air. However, a requested maximum value of 140.00 grains of water per pound of dry air absolute humidity is being allowed based on data submitted on 7/31/03 that indicates a linear relationship between absolute humidity and PEMS NO_x concentration output.

measured by the failed sensor. MeadWestvaco must check, and demonstrate, that the sensor validation system validates sensor data in this way for every minute of PEMS operation. In accordance with §75.10(d)(1), all valid data recorded by the PEMS must be used to calculate the hourly average NO_x emission rates. To validate an hourly average, for each fifteen-minute quadrant of the hour in which the unit combusts any fuel, there must be at least one valid data point.

(c)   MeadWestvaco shall implement a sensor validation alarm system to inform the operator when sensors need repair and to indicate that the PEMS is out-of-control. In setting up the alarm system, a demonstration shall be performed at a minimum of four different PEMS training conditions, which must be representative of the entire range of expected boiler operations. For each of the four or more training conditions, the demonstration shall consist of the following:

    (1)   For all of the sensors used in the PEMS model, input a set of reference sensor values that were recorded either during the training of the PEMS or during a RATA of the PEMS (these values will all be within the PEMS operating envelope). Verify that these reference inputs produce the expected PEMS output, i.e., the expected NO_x emission rate;

    (2)   Perform one-sensor failure analysis, as follows. Artificially fail one of the sensors and then, using the calculated replacement value for that sensor (see paragraph (b), above), assess the effect on the accuracy of the PEMS. Calculate the percent difference between the reference NO_x emission rate from step (1) and the PEMS output. Repeat this procedure for each sensor, individually;

    (3)   Identify the sensor failure in step (2) that results in the worst accuracy. If the highest percent deviation exceeds ± 10.0%, then set up the PEMS to alarm when any single sensor fails. If none of the percent difference values exceeds 10.0%, proceed to step (4);

    (4)   Perform two-sensor failure analysis, as follows: Artificially fail the sensor from step (3) that produced the worst accuracy and also fail one of the other sensors. Then, using the calculated replacement values for both sensors, assess the accuracy of the PEMS hourly average output, as in step (2). Repeat this procedure, evaluating each sensor in turn with the sensor from step (3);

    (5)   Identify the combination of dual sensor failures that results in the worst accuracy. If the highest percent deviation exceeds ± 10.0%, then set up the PEMS to alarm when any two sensors fail. If none of the percent difference values exceeds 10.0%, proceed to step (6);

    (6)   Perform three-sensor failure analysis, as follows: Artificially fail the two sensors that resulted in the worst accuracy in step (5) and also fail one of the other sensors. Then, using the calculated replacement values for all three sensors, assess the accuracy of the PEMS hourly average output, as in step

(2). Repeat this procedure, evaluating each sensor in turn with the two sensors from step (5);

(7)   Identify the combination of three sensor failures that result in the worst PEMS accuracy. If the highest percent deviation exceeds $\pm$ 10.0%, then set the PEMS up to alarm with any three sensor failures. If none of the percent difference values exceeds 10.0%, then set up the PEMS to alarm with four sensor failures.

The results of this demonstration shall be reported in the Subpart H certification hardcopy test report and in record type (RT) 910 in the quarterly EDR submittal for the quarter in which the demonstration is performed. When the PEMS alarms, the PEMS is out-of-control. The appropriate Part 75 missing data procedures shall be followed (see section 5, below), starting with the hour after the alarm sounds and ending the hour after the problem is fixed and the alarm no longer sounds.

(d)   A daily QA/QC test must be performed. A complete set of reference sensor values that were recorded either during the training of the PEMS or during a RATA of the PEMS shall be input to the PEMS. Verify that these reference inputs produce the expected PEMS output, i.e., the expected NO_x emission rate. If the PEMS NO_x output is within $\pm$ 10.0% of the reference method value, the daily QA/QC test is passed. If the daily QA/QC test is failed, the PEMS is out-of-control, and the appropriate Part 75 missing data procedures shall be followed, starting with the hour after the failed test (or, if the test is not conducted in a timely manner, starting with the hour after the test due date) and ending with the hour in which the test is passed. The results of this check (pass/fail) shall be reported in RT 624 in EDR version 2.2. (Note: Use code '04' in start column 53 (QA test code) for the daily QA/QC check.)

(e)   EPA reserves the right to require MeadWestvaco to use a portable NO_x and CO_2/O_2 analyzer (or, as an option, to use a CEMS, mobile CEMS or reference method) to perform periodic, direct measurement checks against the PEMS, if and when EPA determines that portable NO_x analyzers and the associated measurement methodologies can provide an adequate PEMS accuracy check. EPA will provide the necessary information to MeadWestvaco on, e.g., performance specifications, sampling frequency, methodology, and reporting, should this become a requirement. Over the next few months, EPA will test several portable chemiluminescence and electrochemical NO_x and CO_2/O_2 analyzers at combustion turbine sites to determine how well these analyzers work. It is anticipated that should this check become a requirement, it would be implemented so that the unit is tested at different operating levels from check to check.

(f)   MeadWestvaco shall perform initial certification tests on the PEMS prior to reporting any PEMS data as quality-assured   These certification tests must be performed in the following order: (1) ensure that the sensor validation system meets the requirements of paragraph (b); (2) train or retrain, as applicable, the PEMS according to the manufacturer's recommendations; (3) ensure that the requirements for an alarm system in paragraph (c) have been met; (4) perform a NO_x RATA at the

normal operating level according to Part 75, Appendix A, §6.5, using paired PEMS and reference method data, calculating the relative accuracy on a lb/mmBtu basis[4]; and (5) calculate and apply a bias adjustment factor (BAF) at the normal operating level according to the Part 75, Appendix A, §7.6. Until all tests and procedures in (1), (3), and (4) are passed, and all the procedures in (2) and (5) are completed, the appropriate Part 75 missing data procedures shall be followed (see section 5, below).

(g)   Ongoing QA/QC tests shall be performed according to the following table.

Test	Performance Specification	Frequency
Daily QA/QC	$\leq 10.0\%$ of reference NO_x emission rate	Daily (paragraph (d))
Direct $NO_x/CO_2/O_2$ measurement with portable analyzer	To be provided	To be provided (paragraph (e))
RATA	RA > 7.5% and $\leq$ 10.0% (semiannual) RA $\leq$ 7.5% for annual frequency	Annual or semiannual and after each PEMS training (paragraphs (f) and (h))
Sensor validation system (minimum data capture)	Check for production of at least 1 valid data point per 15 minutes (paragraph (b))	Before each RATA (paragraphs (f) and (h))
Bias adjustment factor	If $d_{avg} \leq |cc|$, bias test is passed	After each RATA (paragraphs (f) and (h))
PEMS training (Linear correlation and F-test)	$r \geq 0.8$, and $F_{critical} \geq F$	According to paragraphs (f) and (h)
Sensor validation compliance alarm system set-up	(see paragraph (c))	After each PEMS training (paragraphs (f) and (h))

The daily QA/QC test is described in paragraph (d) above. The direct $NO_x/CO_2/O_2$ measurement, if and when it is required by EPA, is discussed in paragraph (e) above. On-going RATAs shall be performed at the normal operating level according to the procedures in Part 75, Appendix B §2.3.1 and, as discussed in paragraphs (f) and (h), shall be calculated on a lb/mmBtu basis. Immediately prior to a RATA, the BAF shall be set to 1.000. Before each RATA, MeadWestvaco shall check that the sensor validation system is set to provide one valid data point per 15 minute period, as discussed in paragraph (b). After each RATA, MeadWestvaco shall calculate and apply a bias adjustment factor at the normal operating level according to Part 75, Appendix A, §7.6. MeadWestvaco shall train or retrain the PEMS according to paragraphs (f) and (h). After each training, MeadWestvaco shall perform a normal operating level RATA and bias test, described in paragraph (f), and the compliance alarm demonstration in paragraph (c).

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[4]   RATAs must be calculated on a lb NO_x/mmBtu basis because MeadWestvaco indicated that NO_x mass emissions for boiler Z008 are calculated using heat input (mmBtu/hr) from a fuel meter and gas heat content times NO_x emission rate (lb/mmBtu).

(h)   After initial certification, if a RATA is failed due to a problem with the PEMS, or if changes occur that result in a significant change in NO_x emission rate relative to the previous PEMS training conditions (e.g., boiler aging, process modification, new process operating modes, or changes to emission controls), the tests and procedures in paragraph (f) shall be performed on the PEMS in the order specified in that paragraph. In addition, prior to performance of the RATA (see (4) in paragraph (f)), the PEMS must pass a linear correlation (r) and an F-test using the paired PEMS vs. reference method data used in retraining the PEMS (see (2) in paragraph (f)). The linear correlation (r), the F-test, and the tests and procedures in (1), (3), and (4) in paragraph (f) shall be passed, and the procedures in (2) and (5) in paragraph (f) shall be completed, by the earlier of 60 unit operating days (as defined in §72.2) or 180 calendar days after the failed RATA or after the change that caused a significant change in NO_x emission rate. MeadWestvaco shall use the appropriate Part 75 missing data procedures (see section 5), starting from the hour of the failed RATA or the hour after the change that caused a significant change in NO_x emission rate, as applicable, and ending the hour after successful passage or completion of the tests and procedures, as required above.

(i)   For any hour or partial hour of startup or shutdown operation or for periods of oil-firing, MeadWestvaco must report the maximum potential NO_x emission rate (MER), calculated in accordance with §2.1.2.1 (b) of Appendix A to Part 75. A maximum potential NO_x concentration (MPC) of 600 ppm, in accordance with Part 75, Appendix A, Table 2-2, an O2 diluent cap value of 14.0% O2, and f-factor of 8,710 dscf/mmBtu for gas-firing or 9,190 dscf/mmBtu for oil-firing shall be used in the MER calculation.

(j)   Over the next few months, EPA will test several statistical procedures at two combustion turbine sites to determine how well these procedures predict PEMS accuracy. Although MeadWestvaco is currently required to perform a linear correlation (r) and an F-test in paragraph (h), EPA reserves the right, as a condition on today's approval of the PEMS, to add new statistical procedures or to change the ones currently required. EPA will provide the necessary information to MeadWestvaco should new or changed statistical procedures become a requirement.

5. Missing Data Substitution

Under §75.46, MeadWestvaco must demonstrate that all missing data can be accounted for in a manner consistent with the applicable missing data procedures in subpart D. The MeadWestvaco petition states that Unit Z008 will meet the applicable missing data procedures in subpart D (except as provided in paragraph (i), above). This includes the general provisions (§75.30), initial missing data procedures in §75.31, determination of monitor data availability (§75.32), and the standard missing data procedures in §75.33.

6. Additional Requirements

A monitoring plan is due 45 days prior to the initial certification tests (§75.62) described in

paragraph (f) above. EPA notes that a hardcopy monitoring plan for Z008 was submitted with the petition. However, the PEMS operating envelope was not included in the hardcopy monitoring plan. MeadWestvaco shall submit the operating envelope for boiler Z008 to the Alabama Department of Environmental Management and to EPA Region 4 for inclusion in the hardcopy monitoring plan. Any time changes are made to the PEMS operating envelope, the complete, revised PEMS operating envelope shall be submitted in a hardcopy monitoring plan by the applicable deadline in §75.62(a)(2). More information on monitoring plan submittals and other submittals can be found at: http://www.epa.gov/airmarkets/monitoring/submissions/monplan.html

MeadWestvaco shall follow the EDR version 2.2 reporting instructions, found at: http://www.epa.gov/airmarkets/reporting/edr21/, in conjunction with the supplementary PEMS EDR reporting document attached to this petition response, to report data from the PEMS. Monitoring Data Checking (MDC) software that can be used to quality assure the electronic reports prior to submission is found at: http://www.epa.gov/airmarkets/reporting/index.html.

Amendment to the January 28, 2003 Petition Response

EPA has revisited the conditions of the January 28, 2003 petition response for the combustion turbine at the Mahrt mill (Unit X022) and has concluded that certain modifications to that response are necessary. In particular:

(1)   MeadWestvaco shall replace the statement: "Except for burner mode parameter, if a PEMS input parameter value goes below the minimum or above the maximum table values, that input parameter value shall not be used in the calculation of the PEMS hourly average output values." in paragraph (a) of the January 28, 2003 petition response with the following statement:

> Except for burner mode parameter, if any PEMS input parameter value goes below the minimum or above the maximum table values by 5 percent or more, the PEMS shall be considered out-of-control, and the maximum potential NO_x emission rate (MER) shall be used, calculated according to paragraph (i), starting with the hour after the sensor value goes outside of the PEMS operating envelope and ending with the hour after the sensor value is back within the PEMS operating envelope.

(2)   MeadWestvaco shall replace paragraph (h) of the January 28, 2003 petition response with the following paragraph:

(h)   For any hour or partial hour of startup, shutdown, or lean/lean turbine operation (burner modes 0 or 1), MeadWestvaco must use 150 ppm as the NO_x MPC when gas-firing or 200 ppm as the NO_x MPC when any oil is fired, pursuant to Part 75, Appendix A, Table 2-2 and §2.1.2.1(b), to calculate NO_x MER, as defined in §72.2, and to determine O_2 level for the purpose of reporting emissions.   10

(3)   For Unit X022, MeadWestvaco shall follow the EDR version 2.2 reporting instructions, found at: http://www.epa.gov/airmarkets/reporting/edr21/, in conjunction with the final supplementary reporting guidance attached to this petition response, to report data from the PEMS.

EPA's approval of MeadWestvaco's petition under §75.66(d) and Subpart E relies on the accuracy and completeness of the information in the April 30, 2003 petition and in the May 5, July 25, and July 31, 2003 petition amendments, and is appealable under Part 78 of the Acid Rain regulations. If there are any further questions or concerns about this matter, please contact John Schakenbach of my staff at 202-564-9158 or at (schakenbach.john@epa.gov) .

Sincerely,

Sam Napolitano, Acting Director
Clean Air Markets Division

cc: John Schakenbach, EPA, CAMD
      Manuel Oliva, EPA, CAMD
      Lynn Haynes, EPA Region 4
      David McNeal, EPA Region 4
      Anthony Yarbrough, ALDEM

Attachment

EDR REPORTING
[PREDICTIVE EMISSIONS MONITORING SYSTEMS (PEMS)]

I.   Introduction

Table A-15, below includes the essential EDR record types for units that have received approval under Subpart E of Part 75 to use predictive emissions monitoring systems (PEMS) to report NO_x emissions. The scope of Table A-15 is limited to affected oil and gas-fired units (i.e., boilers and combustion turbines) that:

- Have a single unit-single stack exhaust configuration; and
- Use Appendix D methodology to quantify unit heat input; and
- Use Appendices D and G to account for SO_2 and CO_2 mass emissions (if the units are in the Acid Rain Program); and
- Do not co-fire oil and gas.

For PEMS reporting, EDR version 2.2 must be used, since fuel-specific missing data substitution for NO_x emission rate is required. For hourly NO_x emission rate reporting, RT 320 is used. Hourly 200-level records are <u>not</u> reported for either NO_x concentration or diluent gas (O_2 or CO_2) concentration.

For units that burn more than one fuel type, separate PEMS are required for each fuel. Each PEMS should be reported as a separate monitoring system with a unique monitoring system ID in RT 510. Each PEMS will require its own set of certification, recertification, and quality assurance tests.

II.   Interpreting Table A-15

In Table A-15, the first column identifies the record type. The second column gives a brief description of the record type. The third, fourth, and fifth columns indicate whether the record type must be reported for a particular type of submittal. The third column header, "MP," refers to monitoring plan submittals. The fourth column header, "CT," stands for certification or recertification applications. The fifth column header, "QT," refers to electronic data report submittals. The letter codes in columns 3 through 5 are defined as follows:

Y   This record type is required for this type of submittal (monitoring plan, certification/recertification application or electronic data report)

N   This record type is not appropriate for this type of submittal.

O   This record type is appropriate, but optional for this type of submittal.

A   This record type <u>may</u> be required for this submittal. If any doubt exists as to the need to submit this record type, consult the appropriate EDR instructions.

T   This record type is required each time a quality assurance test (e.g., a RATA) is performed.

Record Type	Description	MP	CT	QT	Program Applicability and Comments
531	Defaults and Constants	Y	Y	Y	ARP, Subpart H • (See supplementary reporting instructions)
535	Unit and Stack Operating Load Data	Y	Y	Y	ARP, Subpart H Required for any unit using load-based missing data procedures for NO_x or fuel flow rate.
536	Range of Operation, Normal Load, and Load Usage	Y	Y	Y	ARP, Subpart H • Report RT 536 to define operating range and normal load for RATA testing
540	Fuel Flowmeter Data	Y	Y	Y	ARP, Subpart H
550	Reasons for Monitoring System Downtime or Missing Parameter	N	N	A	ARP, Subpart H • (See supplementary reporting instructions)
556	Monitoring System Recertification, Maintenance, or Other Events	N	N	A	ARP, Subpart H • Report RT 556 for recertification of the PEMS or fuel flowmeters • (See supplementary reporting instructions)
585	Monitoring Methodology Information	Y	Y	Y	ARP, Subpart H • (See supplementary reporting instructions)
586	Control Equipment Information	A	A	A	ARP, Subpart H
587	Unit Fuel Type	Y	Y	Y	ARP, Subpart H
610	RATA and Bias Test Data	N	Y	T	ARP, Subpart H • Report RTs 610 each time a RATA is performed for certification, recertification or for on-going QA/QC. • (See supplementary reporting instructions)
611	RATA and Bias Test Results	N	Y	T	ARP, Subpart H • Report RT 611 each time a RATA is performed for certification, recertification or for on-going QA/QC. • (See supplementary reporting instructions)
624	Other QA Activities	N	N	Y	ARP, Subpart H • Report RT 624 for PEMS daily QA/QC and for PEMS periodic accuracy checks using a portable analyzer. • (See supplementary reporting instructions)
627	Fuel Flowmeter Accuracy Test	N	A	T	ARP, Subpart H • Report only for fuel flowmeters that are certified and quality assured by periodic accuracy tests according to Section 2.1.5.1 or 2.1.5.2 of Appendix D.
628	Fuel Flowmeter Accuracy Test for Orifice, Nozzle and Venturi Flowmeter	N	A	T	ARP, Subpart H • Report only for orifice, nozzle and venturi-type flowmeters that are quality assured by periodic transmitter/transducer calibrations.
629	Fuel Flow-to-load Ratio Test Baseline Data	N	N	A	ARP, Subpart H • Report if quarterly fuel flow-to-load ratio test in Section 2.1.7 of Appendix D is used to extend fuel flowmeter accuracy test deadlines.

13

Record Type	Description	MP	CT	QT	Program Applicability and Comments
630	Quarterly Fuel Flow-to-load Ratio Test Results	N	N	A	ARP, Subpart H • Report if quarterly fuel flow-to-load ratio test in Section 2.1.7 of Appendix D is used to extend fuel flowmeter accuracy test deadlines.
696	Fuel Flowmeter Accuracy Test Extension	N	N	A	ARP, Subpart H • Use RT 696 to claim allowable extensions of fuel flowmeter accuracy test deadlines.
697	RATA Deadline Extension or Exemption	N	N	A	ARP, Subpart H • Report when claiming a RATA deadline extension Appendix B, Section 2.3.3.
699	QA Test Extension Based on Grace Period	N	N	A·	ARP, Subpart H • Report when claiming a QA test deadline extension under Appendix B, Section 2.2.4.
900	Certifications	Y	Y	Y	ARP
901	Certifications	Y	Y	Y	ARP
910	Comments	Y	Y	Y	ARP, Subpart H • (See supplementary reporting instructions)
920	Comments	O	O	O	ARP, Subpart H
940	Certifications	Y	Y	Y	Subpart H
941	Certifications	Y	Y	Y	Subpart H
999	Contact Information	O	O	O	ARP, Subpart H

14

SUPPLEMENTARY EDR REPORTING
INSTRUCTIONS FOR PEMS

For a unit with an approved petition to use a predictive emissions monitoring system (PEMS), use the following supplementary instructions, in conjunction with the EDR version 2.2 Reporting Instructions document, to prepare the required EDR submittals.

RT 320

Monitoring System ID (10). Report the monitoring system ID (from RT 510, column 13) of the PEMS used to determine the NO_x emission rate during the hour.

F-Factor (26). Leave this field blank.

Average NO_x Emission Rate for the Hour (36). Report the average unadjusted NO_x emission rate for the hour (lb/mmBtu), rounded to three decimal places, as determined by the PEMS. For hours in which you use missing data procedures, leave this field blank.

Adjusted Average NO_x Emission Rate for the Hour (42). For each hour in which you report NO_x emission rate in column 36, apply the appropriate adjustment factor (1.000 or the BAF) to the unadjusted average emission rate, and report the result rounded to three decimal places. For each hour in which you use missing data procedures, report the appropriate substitute value.

Formula ID (50). Leave this field blank.

Method of Determination Code (53). Report "03" when you use the PEMS to determine the NO_x emissions rate. Report "12" when you report the fuel-specific maximum NO_x emission rate (e.g., during hours of startup or shutdown or when NO_x controls (if any) are not functioning properly). During hours when you use other missing data procedures, report the appropriate MODC listed in the EDR instructions.

RT 328

NOx Methodology for the Hour (45). Report "NOXR-PEMS".

RT 510

The PEMS monitoring system consists of either one or two data acquisition and handling system (DAHS) components. For single-component PEMS systems or for systems where the PEMS software and standard DAHS software have the same manufacturer/provider, model or version number, etc., report one RT 510 for the PEMS system. If the PEMS software and the standard DAHS software have different manufacturer/providers, model or version numbers, etc., report each as a separate RT 510 with the same PEMS monitoring system ID.

15

Component ID (10). Report the three-character alphanumeric ID for each DAHS component.

Monitoring System ID (13). Create a unique three-character alphanumeric ID for each PEMS monitoring system. Define a separate NOX PEMS system for each fuel type. For sources

switching from NO$_x$ CEMS or Appendix E to PEMS, do not re-use the CEMS or Appendix E system ID numbers.

System Parameter Monitored (17). Report "NOX" for the system parameter monitored.

Primary/Backup Designation (21). Report "PE" to indicate that this is a predictive emissions monitoring system.

Component Type Code (23). Report "DAHS" as the component type code.

Sample Acquisition Method (27). Leave this field blank.

Manufacturer (30). Report the name of the manufacturer or developer of the software component.

Model/Version (55). Report the model/version of the software component.

Serial Number (70). Report the serial number, if applicable—otherwise leave blank.

RT 531

Parameter (10). Report "NORX" as the parameter monitored. (You should report one 531 record for each fuel type.)

Default Value (14). Report the fuel-specific maximum potential NO$_x$ emission rate (MER), in units of lb/mmBtu.

Units of Measure (27). Report "LBMMBTU".

Purpose or Intended Use (34). Report "MD" for missing data.

Type of Fuel (37). Report the fuel type code for the fuel. (See the EDR Instructions for RT 531 for the list of available codes.)

Indicator of Use (40). Report "A" for any hour.

Source of Value (41). Report "DEF" for default value.

RT 550

Parameter (10). Report "NOX".

Monitoring System ID (14). Report the monitoring system ID, from RT 510, of the NOX PEMS system.

RT 556

16

Component ID (10). Report the PEMS component ID subject to recertification/diagnostic

testing, if a specific component is involved. If the event is system, not component, specific, leave this field blank.

Monitoring System ID (13). Report the monitoring system ID, from RT 510, of the NO_x PEMS system.

Event Code (16). Report code "99" (i.e., "Other").

Code for Required Test (19). Codes for PEMS systems are:

80 PEMS daily QA/QC, sensor validation system check, train or retrain (if manufacturer recommends), sensor validation compliance alarm check, statistical tests, and normal operating level RATA and bias test;

81 PEMS daily QA/QC, and PEMS check with portable analyzer;

Beginning of Conditionally Valid Period (31, 39). If conditional data validation is used, report the date and hour that the probationary PEMS daily QA/QC test was successfully completed according to the provisions of §75.20(b)(3)(ii).

Note: For PEMS, you may only use conditional data validation if the "event" in column 16 requires RATA testing. If you elect to use conditional data validation, you must complete the RATA within the allotted time in §75.20(b)(3)(iv).

RT 585

Parameter (10). Report "NOXR" as the parameter code associated with the PEMS. Report one RT 585 for each generic fuel type combusted.

Monitoring Methodology (14). Report "PEMS" as the monitoring methodology for the PEMS.

Missing Data Approach for Methodology (28). Report "FSP75" for the fuel-specific missing data approach for the PEMS methodology.

RT 610

Units of Measure (33). Report "2" (lb/mmBtu) as the units of measure.

Value from CEM System Being Tested (34). Report the average value recorded by the PEMS, for each RATA run.

RT 611

Units of Measure (34). Report "2" (lb/mmBtu) as the units of measure.

Arithmetic Mean of CEM Values (35). Report the arithmetic mean of all the RTs 610 PEMS values associated with the RATA.

Number of Load Levels Comprising Test (133). Report "1".

BAF for a Multiple-Load RATA (134). Leave this field blank.

RT 624

Component ID (10). Report the PEMS software component ID from RT 510.

Monitoring System ID (13). Report the NO_x monitoring system ID from RT 510.

Parameter (16). Report "NOX".

QA Test Activity Description (30). Fill in appropriately.

Reason for Test (51). Report "Q".

QA Test Code (53). Report one of the following codes, as appropriate:

04	PEMS daily QA/QC
05	Periodic check of PEMS accuracy with a portable analyzer, CEMS or reference method

RT 910

Text (4). Briefly describe the PEMS.

18