Proceedings of the 1999
Source Testing in the New Regulatory World
Workshop II

EPA Contract Number 68-D-98-046

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January 28, 2000

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Introduction

The second *Source Testing in the New Regulatory World* Workshop was held in Raleigh, North Carolina, on November 2 through November 4, 1999. The workshop, sponsored by the U.S. Environmental Protection Agency (EPA), provided a forum for open discussion among the EPA's Emission Measurement Center, the EPA regional offices, and State and local agencies regarding source testing issues and concerns.

A list of acronyms and an agenda from the workshop are provided following this introduction. A final participant list is provided in Appendix A.

LIST OF ACRONYMS

ADI	Applicability Determination Index
AIM	Architectural/Industrial Manufacturers
AMS	Advanced Monitoring Systems
AOP	angle of projection
AOV	angle of view
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BOD	Biological Oxygen Demand
BTS	Bureau of Technical Services
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAM	Compliance Assurance Monitoring
CARB	California Air Resources Board
cfm	cubic feet per minute
CO_2	carbon dioxide
CO	carbon monoxide
CE	Capture Efficiency
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CMS	Continuous Monitoring System
COMS	Continuous Opacity Monitoring System
CPMS	Continuous Parameter Monitoring System
CTM	Conditional Test Method
CY	calendar year
DQO	Data Quality Objectives
DOE	Department of Energy
EMAD	Emissions, Monitoring, and Analysis Division
EMC	Emission Measurement Center
EMMC	Environmental Monitoring Management Council
EPA	Environmental Protection Agency
ESD	Emission Standards Division
ETV	Environmental Technology Verification
FESOP	Federally Enforceable State Operating Permit
FID	Flame Ionization Detector
FR	Federal Register
FTIR	Fourier Transform Infrared
FV	face velocity
FY	fiscal year
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectroscope
GFAAS	Graphite Furnace Atomic Absorption Spectrometry
GFC	gas filter correlation
GMACT	Generic Maximum Achievable Control Technology

GPRA	Government Performance and Results Act
HAPs	Hazardous Air Pollutants
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
HON	hazardous organic NESHAP
ICP	Inductively Coupled Plasma Emission Spectrometry
IP	International Paper
HWC	hazardous waste combustor
HWI	hazardous waste incinerator
LAER	Lowest achievable emission rate
LCL	Lower Confidence Level
LIDAR	Light Detecting and Ranging
MACT	Maximum Achievable Control Technology
MDL	Method Detection Limits
$MeCl_2$	methylene chloride
MEK	methyl ethyl ketone; CAS 78-93-3
MMBtu/hr	million British thermal units
MRRT	Monitoring, Reporting, Recordkeeping and Testing
MSE	Measurement of Source Emission
NA	nonattainment
NAAQS	National Ambient Air Quality Standard
NAS	National Academy of Science
NCASI	National Council for Air and Stream Improvement
NDO	Natural Draft Openings
NELAC	National Environmental Laboratory Accreditation Council
NELAP	National Environmental Laboratory Accreditation Program
NESHAP	National Emission Standard for Hazardous Air Pollutants
NH_3	ammonia
NO	nitric oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
NSR	New Source Review
NTTAA	National Technology Transfer and Advancement Act
OAQPS	Office of Air Quality Planning and Standards
OECA	Office of Enforcement and Compliance Assurance
O&M	Operation and Maintenance
OPG	Operating Permits Group
ORD	Office of Research and Development
OSB	Oriented Strand Board
OSW	Office of Solid Waste
O_2	oxygen
PAHs	Polyaromatic hydrocarbons
PBMS	Performance Based Measurement System

PCB	polychlorinated biphenyl compounds
PCDD/PCDF	pentachlorodibenzodioxin/pentachlorodibenzofuran
PEMS	Predictive Emission Monitoring Systems
PM	Particulate matter
PM_{fine}	Fine particulate matter
POMs	Polycyclic organic matter
ppb	Parts per billion (volume).
ppm	parts per million (volume)
ppmC	parts per million concentration
PQL	Practical Quantitation Limit
PS	Performance Specification
PSEU	Pollutant Specific Emission Unit
PST	Performance Specification Test
PTE	Permanent Total Enclosure
QA/QC	Quality Assurance/Quality Control
RA	Relative Accuracy
RACT	Reasonably Available Control Technology
RATA	Relative Accuracy Test Audit
R&D	Research and Development
SCAQMD	South Coast Air Quality Management District
SES	Source Evaluation Society
SIP	State Implementation Plan
SOCMI	Synthetic Organic Chemical Manufacturing Industry
SO_2	sulfur dioxide
SO_3	sulfur trioxide
SOP	Standard Operating Procedure
SSCAP	Stationary Source Compliance Audit Program
STAPPA/ALAPCO	State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials
THC	Total Hydrocarbons
TOC	Total Organic Compounds
TPY	Tons Per Year
TTE	Temporary Total Enclosure
TTN	Technology Transfer Network
UATMP	Urban Air Toxics Monitoring Program
UV	ultraviolet
VEO	Visible Emission Observation
VOCs	Volatile Organic Compounds
WFI	waste fuel incinerator
WPN2	White Paper Number 2

SOURCE TESTING IN THE NEW REGULATORY WORLD WORKSHOP II

CONFERENCE AGENDA

Day 1 - November 2, 1999 (Tuesday)

8:30am	Welcome	Rima Dishakjian
8:40am	Introductory Remarks	Henry Thomas, Bill Lamason
9:30am	Test Methods Update	Gene Riley
10:15am	*BREAK*	
10:45am	Stationary Source Compliance Audit Program	Gary McAlister
11:30am	Modifications to Performance Specification 1	Solomon Ricks
12:00pm	*LUNCH*	
1:30pm	Performance-Based Measurement System Update	Robin Segall
2:15pm	Low Concentration Alternative to Method 25	Mike Garibay, SCAQMD
3:00pm	*BREAK*	
3:30pm	Emission Testing Problems Encountered in the Field	Fred Ballay/Mike Klein, New Jersey DEP
4:30pm	Questions/Discussion	
5:00pm	*ADJOURN*	

Day 2 - November 3, 1999 (Wednesday)

8:30am	National Environmental Laboratory Accreditation Conference and Field Activities Standards	Dan Bivins
9:15am	Recent Method 301 Validation Submittals	Gary McAlister
10:00am	*BREAK*	
10:30am	Acid Rain and Flow Measurement Issues Panel	John Schakenbach, Bill Grimley, Tom Logan

SOURCE TESTING IN THE NEW REGULATORY WORLD WORKSHOP II

CONFERENCE AGENDA (Continued)

11:30am	*LUNCH*	
1:00pm	What's All the Fuss About PM Fine?	Tom Logan, Ron Myers
2:00pm	Method 18 Modifications	Rima Dishakjian
2:30pm	*BREAK*	
2:45pm	Predictive Emissions Monitoring Systems Performance Specification 16 International Paper XL Project	 Foston Curtis Chris Rascher, Region 1
4:00pm	Methods 203 A, B and C - Someday Soon?	Peter Westlin
4:30pm	Questions/Discussion	
5:00pm	*ADJOURN*	

Day 3 - November 4, 1999 (Thursday)

8:30am	Continuous Monitoring Session	
	PM Continuous Emission Monitoring MACT Monitoring Guidance Compliance Assurance and Title V Monitoring	Dan Bivins Barrett Parker Peter Westlin
10:00am	*BREAK*	
10:30am	Continuous Monitoring Session - Cont'd	
11:30am	Conference Wrap-Up Session	
12:00pm	*ADJOURN*	

♦ NOVEMBER 2, 1999 ♦

Welcome/Opening Remarks
Rima Dishakjian, Workshop Moderator, Emission Measurement Center
Henry Thomas, Associate Director of Operations, Office of Air Quality Planning and Standards
Bill Lamason, Group Leader, Emission Measurement Center

Rima Dishakjian welcomed participants to the second *Source Testing in the New Regulatory World* Workshop. She provided an overview of the make-up of the audience attending the workshop and indicated that only regulatory personnel from EPA headquarters, EPA Regional Offices and State and local air agencies were in attendance. She hoped that this would offer a comfortable atmosphere conducive to open and frank discussions about stack testing, monitoring issues, and problems encountered in the field. She next introduced the keynote speaker, Mr. Henry Thomas, the Associate Director of Operations at OAQPS.

Mr. Thomas emphasized the importance of these conferences. He stated that policies developed by OAQPS must be based on sound technical information and that much of this information comes from the work performed by the EPA Regions and State and local agencies. These conferences are very important in allowing OAQPS to perform their job by ensuring that critical information is communicated to the key people at OAQPS.

Next, Mr. Thomas identified OAQPS's mission as setting national standards such as the NAAQS, NSPS and MACT. Central to this mission is developing guidance for SIPs and national emission standards. EPA and State and local agencies need to work closely to ensure that this guidance makes sense and accomplishes the stated objectives. Another area central to OAQPS's mission is the collection and analysis of air pollution information such as ambient air quality data and emissions data. OAQPS is heavily dependent upon State and local agency activities to collect this data. Finally, OAQPS is required to report to Congress and the public on the Agency's progress in achieving its objectives and goals. This report is largely based on data collected by the State and local air agencies. In short, the relationship between State and local agencies and EPA is critical to the mission of OAQPS.

Mr. Thomas outlined OAQPS's priorities for the coming year. He prefaced his remarks by noting that recent Court decisions and the budget cuts that Congress has been imposing make it more difficult to develop strategies and priorities. Nevertheless, OAQPS does have a direction and priorities, although these priorities will be shaped by the available budget and applicable court decisions. The six areas of high priority for OAQPS for the next 2 - 5 years include: (1) develop revised Ozone/PM NAAQS (including an appeal to the Supreme Court); (2) require regional NO_x controls to meet the ozone standards in the Northeast through the NO_x SIP call and the Section 126 petitions; (3) implement the Regional Haze rule; (4) publish a NSR reform rule; (5) issue all Title V permits by the end of CY 2000; and (6) continue air toxics reduction through implementation of existing MACT standards, development of additional MACT standards, and implementation of the urban air toxics strategy. Mr. Thomas indicated that progress on these priorities depends on the work performed by State and local air agencies and that testing issues are as key in developing MACT

standards as are monitoring, recordkeeping and reporting in developing Title V permits. Mr. Thomas stated that the development of test methods for a PM fine standard is also critical to success of OAQPS's mission.

Next, Mr. Bill Lamason welcomed all participants and hoped that it would be a valuable workshop for all in attendance. He stated that the meeting is a valuable opportunity for a face-to-face dialogue to discuss issues and problems with State and local agency counterparts in all areas of emissions testing. Mr. Lamason provided an overview of EMC by outlining EMC's organization and the responsibilities and functions of both Groups that comprise EMC. He also introduced each individual within EMC and identified the programs for which each individual is responsible. Mr. Lamason indicated that the EMC website and the workshop notebook contains this listing of EMC personnel and their responsibilities.

Mr. Lamason then shared some observations from last year's workshop, including those activities that EMC provides that are invaluable to State and local agencies performing their functions. Some of these include technical support and assistance activities, the EMC website, the audit program, and the CAM workshops. In addition, he summarized those areas where last year's attendees indicated EMC needed to improve to better serve the State and local programs. These include the need for electronic communication (EMC has since established an email group), testing requirements in MACT standards, and compiling databases for the audit program that can be accessed on the web. He indicated that the challenges that lie ahead for EMC include providing more assistance on Title V and MACT implementation issues and continuing the dialogue and outreach efforts through such items as newsletters, cheat sheets, etc.

♦ PRESENTATION 1 ♦

Test Methods Update
Gene Riley, EPA, Emission Measurement Center

Mr. Riley's presentation provided an update on recent method development activities and summarized the methods revision package and the issues associated with it. He also highlighted several current regulatory development activities that are being undertaken within EMC. He began his presentation by summarizing the numbering system that is used to publish test methods in the CFR.

Mr. Riley next explained that EMC is in the process of updating and reformatting all methods by following the EMMC standard format. These revisions were proposed on August 27, 1997, and are expected to be promulgated in early FY 2000. The most significant change since the proposal is that the instrumental methods will be removed from the package.

Mr. Riley explained the purpose of the PBMS and presented the status of the program. He indicated that the program will only apply to analytical methods and that implementation of the program will occur through publication of a Federal Register notice scheduled for proposal in FY 2000.

EPA is awaiting completion of PS-1 before deciding if Method 203 will be reproposed or finalized.

The revisions to Methods 203 A, B and C for determining opacity values in other than 6-minute periods is scheduled for promulgation in FY 2000.

Method 207 for measuring isocyanates using an impinger collection followed by GC analysis was proposed December 8, 1997, and is anticipated to be finalized in FY 2000. The method will be used for SIP limits in source categories such as flexible foam manufacturing, paint spray booths, and pressed board manufacturing.

Methods 2F, 2G, and 2H for velocity and flow rate measurement were developed in response to concerns by the electric utility industry with potential biases of Method 2 and the impact on the acid rain program. These voluntary methods can be used in place of Method 2.

Method 5i was developed to measure low-level particulate levels for calibration of PM CEMS. It consists of an out-of-stack, heated filter and is effective for loadings less than 50 mg/dscm. It was promulgated this year with the Hazardous Waste Incinerator MACT rule.

Revisions to Method 23 for dioxin and furans were proposed on May 31, 1995. That notice proposed to delete the methylene chloride rinse for the dioxin/furan analysis; however, commenters requested the methylene chloride rinse be made optional when using combination trains for split organic samples. The method is being revised to address the comments. Promulgation is targeted for FY 2000.

Mr. Riley next summarized the current status of the performance specifications. EPA's proposal to revise PS-1 in 1994 prompted ASTM to develop Method 6216 and led to a supplemental proposal. EPA expects to finalize the revisions in FY 2000. PS-11 for the certification of PM CEMS was proposed in April 1996 with the HWC MACT standard. As a result of significant changes prompted by the HWC standards, PS-11 is expected to be reproposed in FY 2000. PS-15 for the certification of FTIR CEMS for HAPs that are absorbed by infrared was proposed on August 7, 1997. It allows for several certification options and is anticipated to be promulgated in early FY 2000. Appendix F - Procedure 2 is a QA procedure to accompany PS-11. It was proposed on December 30, 1997, and is scheduled for reproposal in FY 2000.

Revisions and corrections to Method 301 are anticipated to consume a significant amount of EMC's time over the next year. These revisions will address a number of technical areas, with promulgation expected in FY 2000.

Revisions to Methods 306, 306A, and 306B for chromium electroplating were proposed on August 7, 1997, and are expected to be finalized in FY 2000. These revisions clarify the sampling and analytical procedures and reformat the method to comply with the EMMC criteria.

Method 316 for measuring formaldehyde emissions was developed for the mineral wool industry and was promulgated with the MACT regulation in May 1999.

Method 318 (FTIR for phenol, formaldehyde, CO, carbonyl sulfide and methanol emissions from processes using phenolic resins) is designed for use in the mineral wool and fiberglass industries and was also promulgated with the MACT standard in May 1999.

Method 320, a generic, self-validating, extractive sampling procedure using FTIR, was proposed on March 24, 1998. This method can be used for any compound absorbed in the infrared range on any source, provided the QA/QC criteria are met. The final method was promulgated with the Portland Cement MACT standard in May 1999.

Method 321 is an FTIR based method specific for HCl emissions from Portland Cement plants. The final method was promulgated with the Portland Cement MACT standard in May 1999.

Method 322 is another method (uses GFC with infrared spectroscopy) for determining HCl emissions from Portland Cement plants. The draft method was proposed on March 24, 1998, along with the Portland Cement MACT rule. However, promulgation of the method is being postponed until it can be determined why paired GFC/IR and FTIR measurements produced different results at several lime kilns.

Mr. Riley next described the five guidance categories that EMC uses in posting test methods on the EMC website. They are based on validation and publication status of each method.

Mr. Riley then described a number of draft test methods. These included a method for acetonitrile (both gaseous and particulate) that has been validated at a HWI; a method for hydrogen cyanide in the gas phase that has been validated in the laboratory; a method for phenol and cresol emissions (formerly known as Method 317) that has been validated at a fiberglass manufacturing

plant; a method for co-planar PCBs (defined as chlorinated PCBs that produce dioxin-like health effects) that has not been fully validated; and a new method for characterizing filterable and condensable particulate matter.

Lastly, Mr. Riley addressed EMC's efforts in reviewing alternative test methods. He first outlined the procedures that EMC follows in reviewing alternative test methods and then identified some specific requests that EMC has recently reviewed. These included two instrumental procedures as an alternative to the manual PM Methods 5 and 17. Also reviewed was a direct interface GC/MS as an alternative to Methods 18, 25 and 25A. This alternative method was initially approved as CTM-28 and later as alternative method (ALT-017) for specific applications of Method 18. Because EMC lacked the necessary expertise, a peer review process was employed to review a request for an alternative method using a NO_x ultraviolet analyzer. No final decision has been made on this alternative method. EMC also reviewed a request to use a roof flow monitor as an alternative method to Method 14 and 14A. A peer review process was used and the method was approved as ALT-016, with conditions, in August 1998.

In closing, Mr. Riley reviewed several method improvements made as a result of a letter received from the SES regarding improved QA/QC in test methods. He also provided information on the website address where much of this information can be located.

Question: Why have the changes to the instrument methods in part 60 been pulled?

Answer: It was based on the negative comments received from the EPA's Acid Rain program. Industry also provided negative comments and argued that EPA should repropose. EPA plans to repropose the instrument methods (3A, 6C, 7E, 10 and 20) and intends to make the methods consistent.

Question: Is EMC looking at the problems associated with decreasing NO_x limits being imposed on gas turbines? The problem is that the existing test methods cannot measure concentrations as low as those being included in permits. If an enforcement case is litigated, there is no basis to demonstrate that there was a violation because the detection method is higher than the permit limit. Specifically, is EPA considering creating new Subparts (for example, GGa and GGb) to address the issue?

Answer: EPA understands the issue and is looking at it, but currently does not have the resources required to fully address it. With adequate resources, EMC could examine the technologies that are available to measure low NO_x concentrations and also examine the changes to the QA/QC procedures for measuring low NO_x concentrations.

Question: A State representative indicated that during an observation, the testing firm identified that changes to the test method had been made. Can EPA include a date when the test method was amended in the CFR?

Answer: Good point. This is a good suggestion that should be done.

♦ PRESENTATION 2 ♦

Stationary Source Compliance Audit Program
Gary McAlister, EPA, Emissions Measurement Center

Mr. McAlister discussed the SSCAP. He provided a background of the audit program and the status of the current program. The audit program was originally administered by ORD. In late 1996, NERL and EMC assumed the program and jointly operated it for a period of one year. That period ended in January 1998.

In 1998, EMC formed a work group to improve the SSCAP program. A telephone hot-line system called The Source [(919) 541-0200] was developed to assist users in obtaining audit samples. Currently, audit samples can also be requested on-line at the following address: http://www/epa.gov/ttn/emc. Mr. McAlister requested that users provide ample time to fulfill requests. In general, EMC can fill liquid sample requests within 24 hours (excluding weekends) and cylinder requests within 2-3 days.

He stated another improvement EMC is working on is the need for SOP. At present, there are no procedures outlining how the audit samples should be handled, what happens to the samples after a test is compete, and how results should be reported. EMC is currently in the process of developing SOPs to address these issues.

To expedite a sample request procedure, the following information must be included on the audit sample request form: name, agency, address, telephone number, e-mail address, what samples are being requested and for what methods, target concentration (VERY IMPORTANT), date sample is needed and what day testing will take place, shipping location, test site location (for tracking purposes), and any special instructions.

Mr. McAlister then provided a brief description of the methods for which audits are available. These include the following.

Method 6/8 - liquid sample
Method 7 - liquid sample
Method 13A - liquid sample
Method 13B - liquid sample
Method 18 - cylinder sample
Method 23 - solid adsorbent in glass container
Method 24 (solvent based paints) - liquid sample (paint)
Method 25 - cylinder sample
Method 26 - liquid sample
Method 29 - filter and liquid solution
Method 101- filter and liquid solution
Method 101A - filter and liquid solution
Method 101B - filter and liquid solution

In addition to the samples listed above, several samples are currently under development. These include a project for developing an ink sample for Method 24, and a sample for Method 315 (procedure used to measure indicator of POMs).

Mr. McAlister reported that EMC is attempting to track the audit samples electronically to streamline the program and to provide better security. This electronic tracking system should be operational in January 2000 and will include sample requests and reporting of audit samples, all conducted electronically. The EMC QA Team Members listed below can be contacted to request audit samples or to obtain additional information regarding this program:

Terry Harrison	919-541-5233
Gary McAlister	919-541-1062
Wade Peele	919-541-4945
Gene Riley	919-541-5239
Candace Sorrell	919-541-1064

Question: Who pays for the shipping to and from the supplier?

Answer: EMC pays to send samples out and the client or tester pays to ship them back.

Question: For cylinder audits, is it necessary to have someone watch the analysis of the audit sample? Is this still a requirement?

Answer: Yes, EMC would like to continue this process if possible. It protects the integrity of the audit.

Question: Are there going to be audit samples for 6C, 7E, etc.?

Answer: These methods are already set up with numerous performance requirements, so it may not be necessary to audit them. It is not as important to audit these methods as it is to audit many of the other methods. It would be easy to develop audit samples for these methods, but EPA currently doesn't have funds for that.

Question: If a Method 25 audit sample was sent to a testing company instead of going directly to the test site, would you still consider that a valid audit?

Answer: If you don't have any reason to doubt the integrity of the testing company, then it's probably okay.

Question: Can audit samples be shipped to the testing site directly or do they have to go to the agency first?

Answer: Samples can be shipped to either place. If it's sent to the site, it must be understood that the agency needs to break the seal.

Question: Samples are often ordered through the fax and, then a few days before the test, many times the sample is not there. This is a problem because it is often hard to get a live person on the telephone to check on the status. If this happens, can samples be reused?

Answer: Samples can be reused for more than one audit. If a regulator was attached, you could check the pressure and see how much sample is still available. This practice is not encouraged. The canisters should be mailed back after each use. Also, you may contact Candace Sorrell at (919) 541-1064 to check the status of a sample.

Comment: It was suggested that instructions should be included with each sample. In addition, it was stated that sample results should never be included with samples that are sent out. It was also mentioned that EMC should consider making audit samples mandatory, especially for Method 25.

Answer: It is agreed that samples need better operating instructions. In addition, please note that anyone who would like to be part of a monthly conference call is welcome. EPA needs to hear comments from outside individuals.

Comment: It would be good idea to include resealing tape with each sample. The tester could re-seal the sample after use, before shipping it back to the agency.

Question: What is in the Method 18 cylinder?

Answer: The samples are custom made. They can put up to 4 compounds in each canister. You can ask for any compound that is listed on the web page under Method 18. You can get audit samples for all compounds, but this will require multiple cylinders because a maximum of 4 compounds can be placed in one cylinder.

Question: Can the Method 25 audit sample be used for 25A, B, or C?

Answer: It is not appropriate to use Method 25 audits for 25A or 25B. EMC has on rare occasions allowed it to be used for Method 25C, but this is not an ideal situation.

♦ PRESENTATION 3 ♦

Modifications to Performance Specification 1
Solomon Ricks, EPA, Emission Measurement Center

Mr. Ricks's presentation focused on the changes made to PS-1 over the past few years. EPA proposed revisions to PS-1 on November 25, 1994. Based on comments received in response to that proposal, EPA held a stakeholder meeting in 1996. One outcome of this stakeholder meeting was that ASTM formed a subcommittee to develop performance specifications for opacity monitors (D6216). EPA decided to incorporate the D6216 procedures by reference into PS-1 and published a supplemental proposal on September 23, 1998. Promulgation is scheduled for early 2000.

Mr. Ricks next outlined the reasons that EPA proposed revisions to PS-1. These included updating the COMS design and performance requirements and clarifying the owner/operator and monitor vendor obligations. These changes include the following.

Requiring that the optical alignment device clearly show misalignment at ±2 percent opacity.
Requiring that the alignment check be performed at the installation path length instead of the 8 meters that is currently required in PS-1.
Reducing the specifications for the AOV and AOP from 5 degrees to 4 degrees.
Requiring a calibration drift checking system consisting of a zero simulation device and an upscale calibration device.
Requiring alarms and warnings to indicate a faulty condition in the opacity monitoring system.

Requiring, with respect to zero compensation, the opacity monitor to have an automated means to assess and record the accumulated automatic zero compensation on a 24-hour basis. The purpose of this requirement is to achieve a correct response to the zero simulated device. Including a 4 percent opacity compensation allowance for dirt accumulation. For opacity monitors that do not distinguish between dirt and zero compensation, the accumulated zero compensation may be designated as the dirt compensation.

Another requirement in PS-1 addresses the design and access to the external audit filters. Specifically, the filters must be used in conjunction with a zero condition based on the same energy level and the entire beam received by the detector must pass through the attenuator. Also the attenuator insertion point must not interfere with reflected light. With respect to the path-length correction factor, the opacity monitor must automatically correct the opacity emissions measured at the installation point of the monitor to the emissions outlet path length. The path length correction factor cannot be changed by the user or recorded during each calibration check cycle and will set off an alarm when it is being changed from a certified value.

Mr. Ricks addressed the PS-1 changes regarding responsibility for demonstrating the design of a monitor. The PS-1 revisions require that the manufacturer conduct the design specification testing. The testing needs to be performed for each representative monitor. The representative monitor can be selected from either each month's production lot or from a lot of 20, whichever is the smaller lot.

The procedures for design specification testing are outlined in ASTM D6216-98. D6216 includes procedures for the design requirements, as well as additional procedures to determine the insensitivity of the opacity monitor to supply voltage variations and ambient light and also to determine the thermal stability of the monitor.

The PS-1 revisions require that opacity monitor manufacturers conduct performance testing of each instrument prior to shipping the instrument and that each source owner/operator using an opacity monitor conduct performance testing after installation of the monitor. The procedures for the manufacturers performance testing are contained in ASTM D6216-98 and the procedures for the source owner/operators are contained in PS-1. The performance testing includes: an optical alignment assessment to determine if the instrument is capable of detecting misalignment; a calibration error check to demonstrate that the instrument is properly calibrated and can provide accurate and precise measurements; and a system response time check (referred to as the instrument response time check in the D6216 procedures for the manufacturers) for demonstrating that the instantaneous output of the opacity monitor is capable of tracking quick changes in opacity.

Other changes to PS-1 include simplifying the selection of the calibration attenuator by using absolute values instead of a percentage of the applicable limit. The conditioning period has been eliminated because EPA felt that it was not necessary to require an additional 7-day test period. Finally, in response to a number of comments received, the operational test period has been defined to stipulate that the test period must include one full cycle for batch operations and that for continuous processes, the source must operate for at least 50 percent of the 168-hour test period. Finally, Mr. Ricks indicated that PS-1 is now in the EMMC format as well as in plain English.

Question: One State representative indicted that they have a number of old opacity monitors that would not be subject to the revised PS-1 procedures. These old monitors send the data to a central data handling system and all of the calculations are performed at the central system. If the central database system is upgraded, will they now be required to perform the calculation in the opacity monitor instead of the central data handling system?

Answer: Alarms and systems are included for these types of checks and if they are included that may take care of this concern. However, EPA has not fully addressed this issue and more discussion is appropriate.

Question: Another State representative indicated that they currently request, but will soon require, that sources conduct quarterly COM audits. They plan to refer to an EPA-450 series guidance document (EPA 450/4-92-010, *Performance Audit Procedures for Opacity Monitors*) in the regulation. Is this document going to be updated?

Answer: There are no current plans to update that document. Moreover, it is not recommended that the document be referenced in a rule because many monitors referenced in the document are no longer manufactured. However, it would be acceptable to reference only the general audit procedures in the introductory portion of the document.

Question: Sometimes it is necessary for a source owner/operator to change a flange and this may shorten or lengthen the path length. How will this be handled since the revised procedures stipulate that an alarm must go off if the path length is changed?

Answer: The path length can be changed provided it is recorded. In addition, manufacturers can provide instructions on how to change the path length if this situation occurs.

Question: When will Method 203 be issued and will it require quarterly audits?

Answer: EPA will begin working on 203 as soon as the revisions to PS-1 are finalized. However, there is no definite time frame for completing it.

Question: Are there any plans to revise Appendix F of 40 CFR part 60 to incorporate an opacity monitor audit procedure?

Answer: There are no plans to revise Appendix F. Method 203 will address the opacity monitor audit procedure.

Comment: But 203 is an optional method for State and local agencies and Appendix F is required for compliance demonstrations.

Response: EPA may look at renumbering Method 203 and including it in Appendix F. In addition, there is no reason why EPA can't reference Method 203 in a MACT regulation. EPA has a bit of flexibility in this area and will ensure that Method 203 procedures are required where it is appropriate.

Comment: John Bosch with EMC stated that, for a variety of reasons, EPA is being pressured to accept and adopt methods and procedures, including PS-1, developed by voluntary consensus standard organizations such as ASTM. These groups are heavily staffed by the regulated community and more balance is needed with staff from the State and local air agencies. John encouraged all participants to join ($65/year) and to participate in these discussions.

♦ PRESENTATION 4 ♦

Performance-Based Measurement System Update
Robin Segall, EPA, Emissions Measurement Center

Ms. Segall began by defining PBMS. She then discussed the background of PBMS and the proposed goals of the program, including OAR's PBMS implementation plan and regulatory evaluation. She also outlined how PBMS will be implemented for stationary sources.

PBMS is defined as "A set of processes wherein the data quality needs, mandates or limitations of a program or project are specified and serve as criteria for selecting appropriate methods to meet those needs in a cost-effective manner." She stated PBMS will shift the agency's approach to measurement requirements from a step-by-step method to specifying performance criteria and letting the regulated community select any suitable measurement method based on the performance criteria. The goal is to allow the regulated community to use any measurement method that will meet the established performance criteria.

The EMMC Policy Council endorsed Agency-wide adoption of PBMS in 1996 and in May 1997, all EPA programs were encouraged to implement PBMS. At that time, the agency made the decision to limit PBMS to analytical measurements only. Shortly after the Deputy Administrator charged EPA programs to implement PBMS, Laura Autry was appointed to lead OAR's effort to develop a plan for implementing PBMS. OAR's final PBMS implementation plan was completed in May, 1998. The plan is posted on the web at the following address: www.epa.gov/oar/oario.html.

Ms. Segall reported the push for implementation of PBMS came from outside the agency, primarily from commercial laboratories and instrument vendors. The laboratories felt they did not have enough flexibility in modifying EPA methods. The instrument vendors felt that the agency's approach to measurement requirements is a barrier to innovation of new instrument technologies.

The agency plans to accomplish the following goals by implementing PBMS.

To provide a simple, straightforward way for the regulated community to respond to specific measurement needs with reliable, cost effective methods.
To emphasize project-specific method performance needs rather than specific technologies to avoid costly measurement overkill.
To encourage use of professional judgement in modifying or developing alternatives to established agency methods.
To provide a consistent way to express method performance criteria independent of the type of method or technology.
To foster new technology development and continuous improvement in measurement methodology.

Ms. Segall stated that the Ambient Monitoring Program, Acid Rain Program, and the Engines and Vehicles Certification Program will not move fully to PBMS, because they will continue to require up-front approval processes for modifications to their measurement requirements.

She explained that the remaining four programs in OAR will plan regulatory revisions to meet the performance-based rule format.

Fuels Program
Radiation Program
Stationary Source Program
Indoor Air Program

The Radiation Program has control over Methods 111, 114, and 115 in part 61 and plans to make these methods performance-based. The timing is uncertain, but proposal is currently scheduled for May 2000.

In the Stationary Source Program, a total of 83 regulatory subparts and all test methods were reviewed. A decision was made not to open subparts in Parts 60, 61 and 63 to rewrite regulations. Instead, performance criteria will be specified for each of the 30 test methods amenable to PBMS so that the regulated community can use an alternative method which meets the performance criteria.

The proposed format of the draft PBMS rule will require the following five steps.

Step 1	The affected source must include a statement of intent to use PBMS in a site-specific test plan or notification of performance testing.
Step 2	Conduct the performance test.
Step 3	Perform laboratory analysis of samples using PBMS approach.
Step 4	Submit a test report including documentation of the method performance and certification statement.
Step 5	The responsible agency (State, region, etc.) reviews the documentation and decides if it is acceptable based on documentation of data regarding method performance.

Ms. Segall concluded that it is estimated the proposed rule for the Stationary Source Program will be finalized in late 2000.

♦ PRESENTATION 5 ♦

Low Concentration Alternative to Method 25
Mike Garibay, SCAQMD Source Testing

Mike Garibay began his presentation by noting that the ozone levels in the SCAQMD have been decreasing and that there were no Stage 1 alerts this year. One reason for these reduced ozone concentrations is the more stringent limits that are being imposed on sources. These stringent emissions limits (for example, on the order of 1 pound/hour or 5 ppm) led to a need for a compliance test for these low concentration and mass loading limits. In response, the SCAQMD developed a method that is currently widely used. The agency also decided that a validation method was needed. The method measures total VOC at low concentrations using a tank and trap approach, and is intended for combustion sources burning clean fuels. The new method, labeled as Method 25.3, is intended to fill the void in the existing VOC test methods.

Mr. Garibay next outlined SCAQMD's interpretation of the applicability of the existing methods. First, EPA Method 25 is less precise at low concentrations, particularly at combustion sources with large carbon monoxide and water vapor emissions. EPA Methods 25A and 25B are for alkanes, alkenes and aromatics only. EPA Method 18 is a speciation method and is not for total VOC. SCAQMD Method 25.1 is similar to EPA Method 25, except it is simpler to operate in the field and is primarily used in local districts in California. SCAQMD former draft Method 25.2 was removed from consideration because it did not work. It was a temporary solution to the low concentration issue using Tedlar bags and suffered from condensation of the VOC and poor reproducibility. SCAQMD draft Method 25.3 is for low concentrations only and was developed by modifying SCAQMD Method 25.1.

Mr. Garibay explained SCAQMD Method 25.3 is for combustion exhausts less than 50 ppmC and uses a tank and trap approach with small water impingers. If the control efficiency of the control device is being determined, Method 25.1 should continue to be used on the inlet streams or when exhaust concentrations exceed 50 ppmC. Method 25.3 has a provision for deleting the trap when no elevated moisture is present and using a canister to analyze for total VOC. The new SCAQMD Method 25.2 replaces the former draft SCAQMD Method 25.2.

In designing the procedure, SCAQMD wanted to address the complexity of EPA Method 25 by developing a fool-proof method. Their designed method is a simple self-contained sampler that requires no power, heaters or adjustments. Since all analysis is completed offsite, no calibration gases are needed. As in SCAQMD Method 25.1, there is duplicate sampling with probes being placed flush with the port entrance.

Next, Mr. Garibay showed a diagram of the setup of the SCAQMD Method 25.3 and pictures of the duplicate samplers, the trap assembly and the condensate trap. He indicated that the connector line from the probe to the condensate trap is made of Teflon but they have not had any problems with

the tube melting. He also indicated that the flow controller in the trap assembly acts as a critical orifice. The cylinder can be filled two-thirds full and sampling can be stopped at 10" pressure. The condensate trap uses water because water is formed in the lines anyway. After sampling, the Teflon line should be disconnected and flushed with water to collect all condensate. The 4 mil screw cap bottle can be stored and used for multiple sampling runs.

Analysis of samples collected by the canister is by Method 25.1 modified for low concentrations. The instrument is a GC/Oxidation/Reduction/FID with a lower detection limit of 1 ppmC. The condensate sample is analyzed by infrared organic carbon analyzer with a lower detection limit of 1 ppmC. Mr. Garibay presented an example chromatogram readout that shows a clear delineation for carbon monoxide, methane, carbon dioxide, ethylene and ethane. He commented that in the past, the CO_2 peak would have run into the total organics.

In developing the method, SCAQMD made various improvements to a method provided by a contractor after an initial $300,000 investment. These modifications included trap volume reduction, connector line recovery, trap purge for CO_2, and cleaning and handling. The improved method went through 3 sets of Method 301 validation and eventually met all the specifications in Method 301. They obtained 92 percent spike recovery and 20 percent coefficient of variance and concluded that a 1.086 bias correction factor be used. This has met with EPA's approval and is considered 301 validated.

Some implementation issues surrounding the new method included distributing the draft method for comments under the protocol review process of permits. SCAQMD has been allowing use of the draft method subject to protocol review and has required a determination for molecular weight/carbon ratio (guidelines for such a determination are included in the draft method).

In concluding, Mr. Garibay stated that SCAQMD believes the method has superior accuracy and precision than the existing methods. The next phase is to compare the method to Method 25A. Industry and source testing firms have supported the new method, principally because it is easy to run and easier to use that Method 25A. Finally, he stated Method 25.3 is not accurate above 50 ppm and, at those concentrations, the direction of the bias is low.

Question: Are duplicate probes required?

Answer: Yes.

Question: How many canisters are needed for a complete test?

Answer: For a basic test, just one (that is, one set of duplicates) is needed. If the test is conducted for other reasons (for example, developing emission factors), multiple runs are required, specifically, three runs of two.

Comment: Please review the issue regarding moisture content in Summa canisters.

Answer: Mr. Garibay suggested that an article on this issue be read. There is an ideal concentration for recovery of VOC out of a canister (generally about 1 percent). This level is high enough so there is no condensation, but high enough that VOC can fill the canister.

Question: Is this satisfactory to EPA since EPA says not to use Summa canisters?

Answer: EPA allows use of canisters in some applications, such as in Method. 25. However, EPA does not allow the use of canisters in Method 18.

Question: Is this an approved alternative method?

Answer: It has been validated under Method 301, but Method 301 requires a source category by source category validation and SCAQMD validated it for a particular source category for which there is no NSPS . However, SCAQMD was interested in using it for the local sources in the SCAQMD, so EPA agreed that it met the Method 301 criteria. It would have been approved as an alternative, but not for any source for which an approved method had been established.

The SCAQMD method will be posted on the EMC website as a conditional test method as soon as they take the word draft off the title.

Question: What is the sampling time?

Answer: The recommended sampling time is one hour, simply because most permit limits in the South Coast are in terms of pounds per hour. The method does allow for other sampling times and can be adjusted by using different diameter and lengths.

Question: Is SCAQMD looking at other low concentration methods (for example, NO_x)?

Answer: Yes, they are, principally because these emission limits continue to be set at lower and lower levels.

Question: How far along is SCAQMD in developing this low concentration NO_x method?

Answer: They have a couple of concepts and have run a single comparison test for one of these concepts.

Question: Why do you see a problem with concentrations above 50 ppmC?

Answer: The water impinger to collect the condensable portion of the sample can only homogeneously retain a certain amount of VOC, particularly when you are talking about

insoluble VOCs. A certain amount will plate on the walls of the tube and become unrecoverable.

Question: Can you get around that by using a larger vial?

Answer: You may be able to do this conceptually, especially at higher concentrations where you are recovering water solubles.

Question: It seems like the only difference between this method and Method 25 is the use of an ice water bath instead of a dry ice bath. How do you get the detection limit to be so much lower than with Method 25?

Answer: There is actually a very large difference in the approach. Method 25 collects in dry ice, but during the analysis you are actually combusting the contents inside the trap at elevated temperatures. One problem with Method 25 is the CO_2 problem. When you sample, you condense both the CO_2 and water at dry ice temp and the crystallizing locks the CO_2 in the trap. When this is burned off, all the CO_2 is counted as hydrocarbon. Another problem is that the Method is famous for is high blank values - on a good day 15 ppm is about as low as you can get on a Method 25 blank.

Question: How do you keep your canister clean when you could not in a Method 25 sampling system?

Answer: The majority of the contamination in Method 25 is in the trap.

Question: Is there any potential carryover of high molecular weight organics because they haven't been cooled in the ice water trap?

Answer: If you stay below 50 ppm, the amount that does carryover into the canister should be at a sufficiently low concentration that it should not drop out in the canister.

Question: How does California determine if the expected concentration in advance of testing is less than 50 ppm?

Answer: SCAQMD recommends that the source use EPA Method 25 or SCAQMD Method 25.1 in case concentrations are in excess of 50 ppm. Most testing contractors run Method 25.3 at the outlet and Method 25 at the inlet.

♦ PRESENTATION 6 ♦

Emission Testing Problems Encountered in the Field
Fred Ballay and Michael Klein, NJDEP - Bureau of Technical Services (BTS)

Fred Ballay and Michael Klein began their presentation by giving a brief overview of the New Jersey Bureau of Technical Services (BTS). The BTS has two main programs for testing activities. They are the stack test program and the CEM certification program.

The stack test program reviews all protocols, observes 80-90 percent of all stack tests performed to ensure quality data, and reviews all stack test reports submitted for Department review. The latest statistics indicate that approximately 200 stack tests are observed each year.

The CEM certification program conducts equipment protocol reviews, PST protocol reviews, and PST report reviews. Approximately 30 CEM certifications are performed each year. Unfortunately, due to limited staff resources, the testing part of the program is not observed.

Protocols are required to minimize problems encountered in the field, to identify required sampling train components and procedures, and to ensure the method is properly tuned for the source being tested. The purpose of observing stack tests is to ensure methods and protocols are followed. An internal audit performed in 1994 indicated that 47 percent of test observations resulted in significant corrections by BTS.

The most common problems identified in the field are as follows.

Pre-site survey errors such as unacceptable sample locations, equipment and electrical needs/limitations
Sample recovery and handling errors including unacceptable recovery locations, improper reagents and equipment, inadequate procedures, shipping errors
Equipment errors (operating ranges/calibration gases, poor condition or not calibrated, incorrect train components, improper methods)
Procedural errors such as not performing cyclonic flow or leak checks, not following temperature or ice down procedures
Errors caused by inexperienced and/or frustrated testers (mainly end-of-day syndrome)

The presentation included several examples of the more common errors noted in the field and provided several solutions to mitigate the reoccurrence of identified errors. Possible solutions included the following.

Requiring certification of individual testers and consultant companies
Promoting facility awareness and communication
Providing adequate regulatory oversight

It was noted that requiring individual certification would not solve the problem. Instead, the company should be certified. Each State or regulatory agency needs to establish a "hammer" to crack down on testers or firms that continue to violate proper procedures. Companies needing a testing consultant would then have the flexibility to require a minimal level of expertise on their job and in their bid.

Mr. Ballay stressed the importance of promoting facility awareness and communication. Facilities could report their experiences to a "system," which could aid in the future selection of a qualified consultant. Facilities should also pay attention to delays in testing programs and their causes. Billing of down-time can then be easily quantified and confirmed. In addition, training of facility personnel in stack testing issues can be beneficial. Facilities should have some on-site knowledge to detect problems.

Adequate regulatory oversight is necessary to ensure an acceptance percent of errors. It was noted that during observations, BTS still sees about 50 percent errors, even when the tester knows BTS will be on site for observation. Of the 80-90 percent of the test programs observed, approximately 5-10 percent have unobserved errors, which are found in the test report reviews.

Mr. Ballay summed up his advice by saying, "The truth is up there. If you're not observing, you won't see the problems."

Question: What are you doing in the short term to alleviate the problem? How are you weeding out companies? Do you have regulatory mechanism that would allow you to weed out companies?

Answer: Over 15 years ago the Department caught an individual falsifying data. No one in the Department wanted to get caught up in the legal issues. To date, New Jersey has not prosecuted anyone. This is primarily why we need to get into the certification program. If there is not a "hammer," the job won't get done. There needs to be a legal mechanism to penalize companies that take short cuts.

Question: Do you think the "hammer" already exists in the competitive business world?

Answer: I don't believe it does. Tests are awarded based solely on the lowest bid. Companies are not talking to each other to compare testers.

Question: Do you think the economic incentives and the competitiveness of the testing business makes individuals falsify test data to make sure a client passes?

Answer: That's always a concern. It's impossible to watch the data from cradle to grave. People are going to be able to falsify data if they really want to.

Comment: Ron Myers noted that an emission factors group went to over 30 States collecting over 4,000 test reports. They noticed a definite change in the quality of the test reports when they toured New Jersey. Most test reports in other States were poor quality. Being at the site and observing tests makes a big difference in the quality of the final product.

Question: Do you think field work is more in error than laboratory work?

Answer: We do go through the analysis in the report and often find problems in the analytical data.

Question: Are you more apt to approve data with a positive bias?

Answer: Depends on compliance implications. If it affects compliance data one way or another, the data would not be accepted.

Question: How do you capture data on the number of errors found in tests?

Answer: Observation forms are used when tests are observed. The observer is required to document all actions observed (in narrative form) during the test. These documents are then used to develop statistical data.

Question: What criteria is used for rejecting runs?

Answer: Our criteria for rejecting runs are determined case by case.

Question: When method is performed properly, how do you determine if data is in compliance? What is the gray zone in which a compliance determination must be made?

Answer: BTS does not set this zone. BTS looks at the data and determines if it is defensible or not. Then the data is sent to the enforcement group with a recommendation. The enforcement group is then responsible for taking further action if necessary.

Question: Is EPA working on determination of the error in the reference methods?

Answer: Most of standards are written to one or two significant digits. Most agencies would not enforce test results within 10 percent of the allowable rate for the standard.

Comment: Region 7 recently fined a utility $250,000 for falsifying data. They held the facility, not the testing company, responsible for falsifying data because they wanted to send a strong message. Region 7 found it was useful to hold the company responsible rather than the tester. To date, the tester on the job referenced above has not been seen in the Region for several years.

Comment: I feel this is a management problem and not a technical problem. We definitely need a "hammer" to enforce rules, in addition to the ability to charge companies for the agency to be on site to observe tests.

♦ QUESTION AND ANSWER/DISCUSSION SESSION ♦

Day One Topics
Moderator: Rima Dishakjian

Question: With respect to water-based coatings, what is the status of the new method that was being developed in the mid-1990s?

Answer: This was a method using charcoal adsorption tubes, which was dropped due to the fact that the precision is no better than Method 25. EMC is currently working on a new draft method (Method 24) using total evaporation with adsorbent analyzed with an FID. The round robin testing has been completed and it looks promising.

Question: With respect to low NO_x, how low can we go and are there any plans to update subpart GG?

Answer: EPA is reluctant to reopen subpart GG partly because the limits would need to be set very low as a result of recent BACT/LAER determinations. FTIR with a 100 meter path length can go down to the low ppb range, however, accuracy at those levels is another issue. Chemiluminescence can go to the ppm levels, but the real issue is whether the specifications are sufficient at those levels. EPA is starting a task group to address this issue and anyone interested in participating should contact Terry Harrison.

In the South Coast they are getting into the low ppm levels using a chemiluminescence detector. However, they are paying special attention to the calibration standards.

Peter Westlin remarked that there is another QC issue with California in that they do not allow any measurements below 1-2 ppm to be reported.

The issue that the State of New Jersey is addressing relative to low NO_x is not with the analyzer, but with the increasing proportion of NO_2 relative to NO. The method assumes about 90 percent NO and the NO_2 seems to be more difficult to get into the sampler, so the more NO_2, the more uncertainty with the results.

Question: A representative from the State of Pennsylvania indicated that they have conducted testing for formaldehyde on a small wood-fired boiler and using the Solid Waste 0011 method, found a considerable amount of formaldehyde in the last impinger. When they added more DNPH (twice the amount), they found that it all showed up in the front of the impinger train. Consequently, they have always been a little cautious of the results from this method. Also, NCASI has received approval to use their method in lieu of the 0011, which they claim gives numbers that are biased high. The NCASI method was used recently on a press board facility at a number of emission points and Pennsylvania

disapproved the test program because they require that the last impinger be analyzed separately. They were getting anywhere from 25-60 percent breakthrough in the last impinger. Has anyone else noticed breakthrough in the trains on either the 0011 or the NCASI method? Also, did EPA looked at this breakthrough issue when the reference method was promulgated?

Answer: EPA has used 0011 in the past for not only formaldehyde, but other aldehydes and ketones and have found the same problem. As a result, EPA is using FTIR for formaldehyde. The only other option is the industry validated para-rosaniline method for formaldehyde (Method 316) that was developed for the mineral wool and wool fiberglass industry. In addition, the HON requires the use of Method 18, which is not good for measuring formaldehyde. Therefore, EPA has allowed HON facilities to use the para-rosaniline method for formaldehyde. So EPA has shifted away from using the DNPH method.

Question: Is EPA looking at other sampling techniques?

Answer: EPA has validated FTIR for formaldehyde and used Method 301 to validate the para-rosaniline method on the wool fiberglass and mineral wool industries. So, in theory, the para-rosanaline method should be validated for other sources. However, there was no choice with the HON industries because Method 18 did not work.

Question: When more DNPH was added, the testing results were about 1,000 times higher than the emission factor for formaldehyde for wood-fired boilers. What source categories were the basis for the wood-fired boiler emission factor?

Answer: New draft emission numbers were just released that were based on numerous tests conducted at particle board manufacturing facilities, plywood manufacturing facilities and wood furniture manufacturing facilities.

Question: What is EPA's stance on the use of alternative flow methods such as hot wire anemometers or vane anemometers?

Answer: It depends on the application. EMC has recommended to certain States that it is acceptable to use a hot wire or vane anemometer at low flow rates in certain non-compliance applications. There is a guidance document on the EMC website that addresses the use of alternative methods.

♦ NOVEMBER 3, 1999 ♦

♦ PRESENTATION 7 ♦

National Environmental Laboratory Accreditation Conference and Field Activities Standards

Dan Bivins, Field Activities Committee, EPA, Emissions Measurement Center

Mr. Bivins discussed NELAC and the proposed field activity standards. This conference was held to establish a consensus, to encourage uniformity, and to foster cooperation among States by adopting uniform standards. He stated NELAC is made up of the States, EPA, other federal offices, and contributors and was formed to develop consensus standards. Adoption of the standards by the States and federal offices is voluntary. EPA maintains oversight of the accrediting authorities to ensure uniformity among the States. Mr. Bivins stressed that the State and federal agencies grant accreditation to laboratories under their authority and reciprocity is automatic among participating State agencies.

Mr Bivins stated NELAC participants include a Board of Directors, Voting Members (EPA offices, federal offices, State offices), and Contributors, which include the general public, laboratories, regulated industry, environmental groups, etc. NELAC oversight is provided by USEPA's NELAP, which has authority over the State and federal regulators and the environmental laboratories.

Mr. Bivins next described the standard setting process. This process consists of the following: (1) the standing committee proposes standards; (2) the proposed standards are published and discussed at interim/annual meetings; (3) the house of representatives and house of delegates vote on the standards; and (4) if approved, the standards are published and adopted by the States that participate in NELAP.

Mr. Bivins explained that accredited States must comply with NELAP by doing the following.

Accepting reciprocity
Applying all NELAP standards to laboratories
Refraining from adding supplemental requirements

In 1998, twenty applications were received for NELAC recognition. As of July 1999, the following States were recognized as accrediting authorities: California, Colorado, Florida, Illinois, Kansas, Louisiana, New Hampshire, New Jersey, New York, Pennsylvania, and Utah.

Mr. Bivins stated that those interested in obtaining more information on NELAC can access it on the following two web sites: www.epa.gov/ttn/emc or www.epa.gov/ttn/nelac.

Next, Mr Bivins provided information of the draft MSE standard. This standard was adapted from current NELAC standards and includes proficiency testing, on-site assessment and quality systems. In addition, MSE requires qualification of source testers by verifying the tester's experience, training, and education. A draft of the emission standard is published on the EMC website. The final version will be voted on at the NELAC annual meeting in June 2000.

Question: Why does Florida include standards for air testing?

Answer: It is strictly a voluntary process. Florida chose to include a scope for air.

Question: Would the company be accredited for all methods once the board gives accreditation?

Answer: There are eleven groups and accreditation is by group. You need to be accredited for groups 1-5 as a prerequisite for the other groups.

Question: What do you think about MSE requiring NELAC accreditation for each State?

Comment 1: It will require more work.

Comment 2: Not a good idea.

Question: The problems are in the field because people like to take short cuts. How will accreditation relieve short cuts?

Answer: Individuals on-site will have to be trained (qualified) and will be required to follow SOPs. We envision setting up a complaint process where people can report bad testers. Reporting a tester to this hotline could result in the loss of his/her accreditation.

Comment: It will cost money for individual firms to get accredited. New companies will have a hard time getting started.

Answer: Yes, it is a money issue but we can not afford poor quality data.

Comment: New Hampshire views each test that takes place. Testers will still take shortcuts if observers are not present. It will not help to just require accreditation.

Answer: It is agreed that the combination of accreditation and observers are needed. It is also understood that observers need appropriate training. We need to establish a level of responsibility and a hammer to enforce it.

Question: What has happened in Europe?

Answer: Accreditation is in place in the UK. In Germany it's required for individual testers and companies. It's a world-wide program.

Question: How frequently will States require re-accreditation?

Answer: Every two years after initial accreditation. Every three years each company must submit company status to ensure that the company is still in the same business, etc.

♦ PRESENTATION 8 ♦

Recent Method 301 Validation Submittals
Gary McAlister, EPA, Emission Measurement Center

Gary McAlister began by stating that Method 301 was promulgated in 1991 and that the purpose of this presentation was to review some validation requests that have been submitted over the past three years. For each request, he described the method, listed the target pollutants, and identified the sources to which the method is applicable.

The first request to be addressed was from Georgia-Pacific for measuring formaldehyde emissions from the wood products industry. The method uses two water-filled impingers with isokinetic sampling. The analysis is performed by adding acetyl acetone to the sample and measuring the color intensity by UV/visible spectrophotometer. The color intensity is related to the formaldehyde concentration in the sample. Gary noted that there is a published formaldehyde method that is validated for hazardous waste incinerators. EPA has received comments that it doesn't work well for other industries, probably because it uses a strong acidic solution and could be forming formaldehyde through reactions; however, EPA has not been able to confirm this. Nevertheless, Georgia-Pacific concluded that acetyl acetone was a better procedure. The target pollutant for the Georgia-Pacific procedure is formaldehyde and the applicable source is resin plants that produce formaldehyde. This method was approved in March 1997 with a correction factor of 0.95.

The second request addressed a NCASI chilled impinger method that uses one water-filled impinger and two silica gel-filled adsorbent tubes with non-isokinetic sampling. Analysis of the water impinger is done with direct injection into GC/FID or by adding acetyl acetone followed by spectrophotometer. The silica gel is analyzed by extracting with propanol and then injecting the extract into a GC/FID. The request proposed using the method for a number of target compounds including methanol, acetone, acetaldehyde, methyl ethyl ketone, and formaldehyde. The method was validated for most of these pollutants, but not all. For example, the method was validated for methanol at all sources examined, but not validated for methyl ethyl ketone at the brownstock washer hood. The method was applicable to the following sources at kraft pulp mills: brownstock washer hood, bleach plant scrubber, smelt dissolving tank, and the recovery furnace. The validation request was designed to validate a method for use with the Pulp and Paper MACT regulation. This request was approved in August 1997 for use on MACT sources. It is very similar to Method 308 that was published with the MACT standard and, consequently, sources can use either method for demonstrating compliance.

Mr. McAlister next discussed a validation request for a NCASI method for methanol in process liquids. The sample is collected by taking liquid samples in a glass container directly from process lines and analyzed by direct injection into a GC/FID. The target pollutant is methanol and the applicable sources are kraft pulp mills and sulfite mills. Mr. McAlister speculated that the target compound was limited to methanol because the validation request was submitted after the MACT standard was promulgated and NCASI recognized that the MACT standard allows the option of

measuring methanol as a surrogate for all HAPs. This request was approved in February 1998 for use in all liquid streams. No correction factor was required.

The next validation request presented was also submitted by NCASI and was very similar to the previous chilled impinger method discussed. The main difference is the sources to which the method is applicable. The sample is collected in two water-filled impingers and sampling is not isokinetic. Sample analysis is by direct injection into a GC/FID or by adding acetyl acetone, followed by measurement with a spectrophotometer for formaldehyde. The target pollutants are methanol, phenol and formaldehyde. The applicable sources are wood product mills. The request was approved for Georgia-Pacific mills with a correction factor that varies from 0.98 to 1.03. The approval was issued in May 1998 before the MACT standard was promulgated. Consequently, it was not approved as an alternative to any existing method. It will, however, likely be used as the test method in the standard.

A very recent validation request has been received from Carolina Eastman for a Polymers and Resins plant as an alternative to the test method specified in the Polymers and Resin MACT standard. The alternative collects the sample using a condenser and three silica gel-filled tubes with non-isokinetic sampling. The analysis of the condensate is performed with direct injection of the condensate material into a GC/FID. The silica gel is analyzed by extracting with isopropanol and injecting the extract into a GC/FID. The method is very similar to the NCASI chilled impinger method for kraft pulp mills. The target pollutants are ethylene glycol, acetic acid, and octanol, which are all raw materials and by-products of polymer and resin plants. The sources to which the method is applicable are polymer and resin plants that are subject to the Polymer and Resins (Group IV) MACT standard. Approval of the method is pending.

In closing, Mr. McAlister noted that these 301 validation studies are very expensive and that only groups that are well organized and anticipate a lot of regulatory actions affecting them will consider sponsoring such studies.

Question: What is the cost of a Method 301 validation?

Answer: It varies, but one of the first ones conducted by NCASI for gaseous pollutants at five processes cost in the $600-700,000 range. The ones that have been approved generally average in the $100,000 range.

Question: With respect to the formaldehyde methods, it seems like the NCASI method was first isokinetic and now it is non-isokinetic. Does this have to do with the assumption regarding formaldehyde absorption?

Answer: This depends on whether water is present or not. The problem with the method is that if the flow rate is high enough to allow isokinetic sampling, then the formaldehyde collection efficiency drops off very dramatically. Method 301 requires

testing for bias, but depending on how the spiking is performed, may not reveal problems with non-isokinetic sampling.

Question: Pennsylvania has found that with the second NCASI method, there was a significant problem using two impingers. They discovered approximately 30 percent breakthrough in the second impinger. Has EPA looked into the collection efficiency issue?

Answer: EPA did look at this issue and did not see a problem. If the sampling is done at the right flow rate and the impingers are properly chilled, the collection efficiency should be fine. In addition, the silica gel tube provides a back-up that can be analyzed separately for formaldehyde. There is a problem with the NCASI method; it doesn't work well for other aldehydes and ketones.

Question: What is EPA's position on the NCASI method - does it strip formaldehyde out of wood?

Answer: We are not really sure, but you do get different numbers between DNPH and acetyl acetone; but there is no correlation as far as we can tell.

Question: Method 301 states that a validation test should be compared to a reference method, but it seems that all one needs to do is spike a sample train and get recovery in the right range.

Answer: If there is a validated test method, then Method 301 requires you to validate against that method. In this case, there was no reference method.

Question: Have methods been validated for different types of resins?

Answer: There is a potential for getting interferences, but it is hard to predict what will happen with different chemical mixtures.

Question: Has EPA looked at FTIR for the wood products industry?

Answer: EPA has used it at some plants and some sources (for example, dryer) and it seemed to work well. The real problem is the cost of the system.

Question: Are there any sampling problems with FTIR versus wet chemical methods?

Answer: If the right methods are used and sampling is at the right location, there should be no problems. However, moisture content is a real issue with FTIR measurements.

Question: Part 63, subpart H, the HON, requires the use of Method 18 for TOC. However, Method 18 can't detect HAPs and if you use another method it must be validated against the reference method. So if Method 18 doesn't work, what would you validate the alternative method against?

Answer: For formaldehyde, EPA allowed the use of Method 316 that was validated at another facility. It is really a case-by-case call to determine the appropriate validation method for each alternative. An example is a facility in Indiana that emits methanol and they were required to do a Method 18. The consultant stated that it would be difficult to do with Method 18 (although they could have done a direct GC interface). The consultant recommended using Method 308, which was cheaper. The testing was performed and the source liked the results and submitted them to EPA. EPA's concern was allowing the use of Method 308 because it wasn't validated for this source. EPA decided that the test using Method 308 could qualify as a modified Method 18, but the source had not followed all the Method 18 QA criteria. EPA asked the facility to go back and do the QA required under Method 18. The facility did this and EPA accepted the data. The bottom line is that EPA needs to be confident that they are getting good data.

Question: The General Provisions at §63.7(f) allow the use of alternative test methods when approved by EPA. The General Provisions also allow EPA to waive performance tests. In some cases, sources ask for approval after they have conducted a performance test using an alternative method. What are EMC's feelings about waiving the performance test and can the Regional Offices waive the requirement to do a performance test?

Answer: Waiving the performance test is not a good idea because there are no assurances that the alternative method will work and provide good data.

♦ PRESENTATION 9 ♦

Acid Rain and Flow Measurement Issues Panel
John Schakenbach, EPA, Acid Rain Program,
Bill Grimley and Tom Logan, EPA, Emission Measurement Center

Mr. Schakenbach presented a brief overview of methods 2F, 2G and 2H. In addition, he introduced tools useful for people using or reviewing these methods.

He stated that because Method 2 often overestimates flow, two new methods (methods 2F and 2G) were developed for estimating volumetric flow. He stressed that these new methods are optional, as Method 2 is still a valid means of measuring volumetric flow. Method 2F measures both the yaw and pitch angles by using 3-D probes or five-hole probes. A spherical probe is also approved for use with this method. Method 2G just measures the yaw component using a type S probe or a 3-D probe without the pitch determination.

Mr. Schakenbach listed the equipment used with these procedures, which includes the following.

Type S probes, spherical probes, automated type S probe, etc.
Pressure measurement devices (mechanical gauge, etc.)
Yaw angle measurement devices
Wind tunnel to calibrate the probe
Probe supports and stabilization devices
Temperature gauge
Gas density and moisture equipment

Next, he described the major steps involved in performing Methods 2F and 2G.

Qualifying the wind tunnel by using velocity pressure cross-check (to ensure the same velocity is at the standard pitot position as at the test probe position) or axial flow verification (to ensure a straight flow in the tunnel)
Prepare to calibrate the probe by putting a scribe line on it, check to make sure the probe is not bent, zero and calibrate all pressure devices, calibrate and align yaw angle measurement device, and leak check the system
Performing yaw angle calibration to establish the yaw null position of the probe
Performing a velocity and pitch calibration
Preparing for the field test (that is, inspect probe, zero and calibrate pressure devices, etc.)
Performing the field test
Preparing the calculations
Submitting the field test report

Mr. Schakenbach added that Method 2H can be used as an add-on to Method 2, 2F or 2G for determining wall effects, but it can only be used in circular stacks that are no less than 3.3 feet in diameter. There are basically two ways to perform Method 2H. The first method is a calculation approach and the second method is a default approach. The major steps for performing Method 2H include the following.

Locating wall effects traverse points
Determining sampling order
Taking measurements
Recording data
Tabulating velocity values
Performing wall effects calculations
Submitting the field test report

He reported that several tools have been developed to assist in performing these methods. This documentation can be reviewed by logging on to the Acid Rain Web site at: www.epa.gov/acidrain/cems/ cemspg.html. In addition, a comprehensive observer's checklist for all three methods has been developed. Work is currently underway to develop calculation spreadsheets that will be useful for verifying calculations. These spreadsheets will be available some time this fiscal year.

Question: How do all the methods for flow measurement compare to each other?

Answer: A lower flow measurement is generated with the new methods than with Method 2.

Question: Were the wind tunnel tests done on square or round ducting?

Answer: Three wind tunnels were studied. One was an ellipse, one was rectangular and one was circular.

Question: Why did you select velocity ranges of 60 and 90?

Answer: It seemed to encompass the range of velocities that one would find in the field.

Question: Does the method allow you to select lower velocities?

Answer: Yes. The method requires two, but you can select other velocities as long as they bracket the expected average field velocity.

Question: Are all sources with stacks that meet the requirements eligible to use these methods? What is the default wall adjustment factor? Can a source go back retroactively and look at the velocity numbers and decrease them by one-half percent?

Answer: It is not a retroactive application. A source cannot go back and correct retroactively.

Question: Are Methods 2F and G applicable to sources that are not acid rain sources?

Answer: Yes. The last two pages in presentation 9 contain a memorandum that addresses this question. This memo states that they are approved for optional use in place of Method 2 or as a supplement to Method 2 in any specific subpart (part 60, 61, 63, etc.) where Method 2 is now the specified flow rate measurement method. In summary, they are acceptable for any source category where Method 2 is specified.

Comment: If you want to use Method 2 and then take the default of one-half percent, that is permitted.

Question: If a source is using Method 2F in conjunction with Method 2H and that results in an adjustment to the polynomial, do they need to submit a recertification application?

Answer: Yes.

Question: Does the method require checking close to wall points?

Answer: Yes, you must check the near wall points at each port. You have to be careful to shield the port or you will get air coming in or blowing out. This could affect the measurements.

Comment: A guidance document is needed to address how States are to use the new amendments to part 75 for part 60 sources.

Question: Are the part 75 RATA procedures applicable to part 60 sources?

Answer: No, they are applicable to part 75 sources only.

Question: Have you looked at applying methods for non-axial flow for isokinetic sampling with Method 5? Also, have you looked into how to use these methods for correcting for cyclonic flow?

Answer: This is probably worth considering, but it has not been addressed to date. In Method 2G, a provision is included that allows the use of Method 5. This procedure includes the use of a sampling probe together with a type S to perform a yaw null procedure for determining the yaw angle. In this case, they would have to demonstrate in a wind tunnel, with the sampling probe actually sampling, that it does not adversely affect the ability to determine a yaw angle.

Question: You stated that the Acid Rain Program used a value of $200/ton for SO_2 emissions. How did you get this number? Was it quantified in any way, or was it based on increasing the certainty of the measurement by using 2F instead of Method 2?

Answer: Using wall effects and Method 2F, we have come up with a total of 50-75 million dollars nationwide.

Comment: The biggest problem with Method 2 is its sloppy procedure. Multiplying the number of measuring points with the alternate method will only increase the potential uncertainty of the results given the same level of sloppiness on all points being measured.

Answer: We have tried to build in enough procedures in the new methods to make sure testers hold their probes level, wait the appropriate response time, and use the proper calibration coefficient to reduce any uncertainty.

Comment: A training video is available that shows the proper procedure for performing Method 2F. This video is available upon request.

Comment: If you want to use Method 2 and then take the default of one half percent, that is permitted.

♦ PRESENTATION 10 ♦

What's All the Fuss About PM Fine?
Ron Myers and Tom Logan, EPA, Emission Measurement Center

Ron Myers began the presentation by explaining that he will address three main areas: (1) the reasons why there is a need for a new particulate test method; (2) the particulate test methods that are available now; and (3) comments on the method that EPA may develop for measuring PM_{fine}.

Mr. Myers explained the reason for a new PM test method began in 1997 when EPA promulgated new NAAQS for PM_{fine}. This required the development of new emission inventories to characterize the total loading of PM_{fine} to the atmosphere. These new emission inventories then required more comprehensive emission factors, which in turn necessitated more comprehensive test methods to collect the appropriate data to develop a new emission factor. This data will also be used in dispersion models and receptor models to calculate the downwind ambient concentrations and the source contribution to ambient concentrations, respectively.

Mr. Myers provided more detail in each of these areas. He first explained that EPA realized that a large number of areas will potentially exceed the new PM_{fine} NAAQS. Also, since the new standard not only establishes a different numerical value for the level of the standard, but also is a completely different form (that is, measures a certain particle size) of standard, a new PM monitoring network is required to properly characterize the ambient air in these areas. A new PM_{fine} monitoring network was installed in 1998 and this network has begun to generate data. In addition, the NAS stated that measuring total mass of PM was not adequate and that speciation is required to fully characterize the PM. Consequently, full chemical speciation began in October 1999 at 300 sites nationwide. The speciation will identify the elements aluminum through lead, major ions (sulfate, nitrate, ammonium, sodium, and potassium), and total mass and carbon content (elemental, organic, and carbonate).

On the emission inventory side, Mr. Myers indicated that EPA recently issued a requirement for new emission inventories to be developed for PM_{10} and $PM_{2.5}$. These inventories must include condensable particulate as well as precursor compounds such as ammonia, sulfur dioxide, and nitrogen oxides that may be produced as a result of reactions in the ambient air as opposed to generating from an emission source. In order to develop better emission inventories, improved emission factors are needed for a large part of the inventory. This includes factors for PM_{10}, $PM_{2.5}$, condensables, significant precursors. If available, speciated factors would be useful. In order to develop improved emission factors, a more comprehensive test method is required to develop data in all of these areas.

These new emissions data will allow an expanded use of dispersion models to predict ambient air concentrations. This includes incorporating photochemical reactions occurring in the ambient air and modeling chemical species independently. The results of these modeling efforts can be used to

validate the emission inventories and to develop an attainment plan. These new emission data will also allow the use of receptor models to be expanded to use chemical mass balance models more often and to validate both the emissions inventory and the emission sources contributing to the air quality values.

Mr. Myers next presented the test methods that are now available. Specifically, he identified EPA reference methods in 40 CFR parts 51 and 60, EPA mobile source methods, certain State methods and NAS recommended research methods. EPA's existing test methods for PM include Methods 5, 17, 201 and 201A and 202. Methods 5 and 17 measure only total PM and do not distinguish between different size particles or measure condensables or speciated compounds. Mr. Myers stated that neither of these methods are consistent with the NAS recommendations. Methods 201 and 201A are similar to Method 17 in that they measure total mass in the stack, but have a cyclone that measures the PM_{10} fraction. However, they do not measure condensables or speciated compounds. Method 202 was developed with State assistance to address the issue of condensable PM and can be used with Method 17, as well as with Method 5 and 201A. This method is used with a filterable PM method and is designed to measure condensable PM. It requires post-sample conditioning in the field using dry nitrogen bubbling and post-sample separation using methylene chloride. Method 202 also requires post-sample adjustments in the laboratory for ammonia and other compounds that are formed in the impingers. Finally, it provides limited speciation data.

Mr. Myers explained that mobile source methods use dilution sampling to measure filterable PM and employ a 400 cfm exhauster that sends all of the exhaust gas from the engine to the sampler. He explained that idling creates a lot of dilution air, while maximum acceleration creates essentially no dilution. This method also measures condensable PM. However, some recent research indicates that the filter may be heated during the acceleration phase of the federal test protocol and drive off some organics on the filter, thus creating a low bias for PM. This method is not portable in that the source (that is, the automobile) is driven to the test method, as opposed to the stationary source program where the method must be taken to the source.

Mr. Myers next discussed the approximately six different basic designs used for research methods. All include initial particle sizing and all use dilution sampling. Although the dilution ratios vary from method to method, they are generally in the 6:1 range for minimum dilution and 55:1 for maximum dilution. All of these methods have a residence time ranging from a minimum of 5 seconds to a maximum of 4 minutes. None of these methods are currently portable for use in the field, although the method developers will say that they are. The CalTech sampler is a good example. The unit is 7 feet high, weighs 300 pounds and comes in three pieces. The developers say this is portable, but that is debatable.

In developing the PM_{fine} reference method, EPA is trying to use the same techniques that the research methods are using, thus following the NAS recommendations. Specifically, EPA is using the existing particle size methodology at both the 10 micron and 2.5 micron size fractions to develop a federal reference method. Unofficially being called Method 201, this designation is very tentative. Although similar to Method 201B, it adds another cyclone that cuts at 2.5 microns. Proposal is

scheduled for early 2000. The method will use dilution sampling to avoid condensed water, and will be designed to be portable and simple to operate. Because of the volume required for long residence times, it may have a short residence time to make it portable. EPA would like to allow for multiple concurrent samples (total mass, organic carbon, elemental carbon, elements, ions), speciation, and for precursor measurement; however, Method 201B does not allow for precursor measurement. Other existing methods can be used to measure these precursor compounds.

This new method uses an in-stack particle sizing device followed by a venturi to measure the flow rate. Mr. Myers noted that this method has passed the conceptual phase and that the equipment exists and a prototype device has been constructed. The venturi is followed by a mixing chamber for mixing pre-cooled, filtered and dry air. The majority of this air mixture is exhausted at 20-30 cfm; however, a 2-10 liter sample is tapped off into a lab module that will be analyzed by a laboratory. This module includes honeycomb denuders and a filter pack. Subsequent to the laboratory module is the impinger box. The filter pack consists of four filters including a quartz fiber filter, a teflon filter, and a nylon filter followed by another quartz fiber filter. The first quartz filter can be analyzed for organic carbon and elemental carbon. The teflon filter can be analyzed by x-ray fluorescence for total mass and 34 trace elements. The nylon filter, which will be treated so it retains the nitrates, can be analyzed for sulfates, nitrates, ammonium, sodium and potassium ions. The last quartz fiber filter can be reserved for organic compound identification.

Mr. Myers next reviewed the PM_{fine} sample analysis that is being conducted for ambient air samples. EPA intends to use the same laboratories that are used to analyze ambient air samples to analyze stack samples, principally because strict QA/QC requirements for such analysis have been set up. The quartz filter will be analyzed gravimetrically for total mass and elemental carbon, organic carbon, and carbonate carbon will be determined using thermal optical analysis. The teflon filter will be analyzed gravimetrically for total mass and x-ray fluorescence (a non-destruction method) for metals. The nylon filter will be analyzed using filter extraction followed by ion chromatography.

Tom Logan continued the PM_{fine} discussion by commenting that this an ongoing R&D project. He began by showing examples of some of the components of the new PM method, which included the cyclones (both PM_{10} and $PM_{2.5}$), and the annular denuder with the honeycomb design coated with a chemical to absorb the SO_2, NO_x, or ammonia so only the PM goes to the filter in the bottom of the denuder. He next described the use of the venturi to meter flow (20-30 cfm) into the sampling device and through the dilution part. He showed a graph of the SO_2 concentrations in various test runs. Test runs 3 through 7 or 8 showed significant concentrations on the second denuder indicating that breakthrough of the first denuder had occurred. In subsequent tests, the concentration was reduced to less than 400 ppm and very little SO_2 was found on the second denuder. Mr. Logan concluded that they are still evaluating the design and how to control the flow rates with the venturi flow meters before deciding to proceed with the method.

Question: What was the difference between test runs 3 and 24 on your graph? The concentration measured by the first denuder was about the same, but there were large differences in what was caught on the second denuder.

Answer: The ppm being fed into the sample was lower with the latter runs.

Question: Are you traversing with this method?

Answer: No, EPA has not yet conducted this method at a source. EPA is trying to decide how to obtain a correct flow rate before deploying it to the field.

Question: Method 201A allows for cascade impactors. Have you looked at multi-stage impactors for PM_{fine}?

Answer: They have looked at it and have seen particle bounce (that is, carry-over) when over sampling has occurred.

Question: Will EPA allow the use of cascade impactors?

Answer: EPA is far from deciding this, but is leaning away from allowing it. It may be okay for filterable particulate, but not for condensables. It is a tricky procedure to use and cyclones give you the opportunity to sample better.

♦ PRESENTATION 11 ♦

Method 18 Modifications
Rima Dishakjian, EPA, Emissions Measurement Center

Ms. Dishakjian gave a brief discussion of Method 18 and its recent revisions. The modifications include fine tuning the procedures, adding some QA/QC, and putting the method in EMMC format.

Ms. Dishakjian described Method 18 as a generic GC method to be used for speciated VOCs and where the pollutants being emitted from the source are known. It is considered a wide-open method because the tester has the option of using allowed sampling, GC column or detector choices. Any combination can be used as long as the recovery criteria are met. In addition, if a source is visited year after year and the matrix does not change, then only one recovery study is required for that particular sampling and analytical scheme.

Ms. Dishakjian noted that presurvey sampling is an option for characterizing emissions in cases where sources are unsure of the target compounds. However, sources that are certain of the target compounds are not required to conduct presurvey sampling. The presurvey component was moved to the back of the method because the presurvey language is often confused as another sampling option (that is, Summa® canisters). She stated the presurvey component is just grab samples into canisters with qualitative analysis performed to get a general idea of what concentrations to expect.

Ms. Dishakjian indicated a common question asked is what sampling technique should be used for Method 18 at a specific source. She stated the following three options are available.

Direct Interface/Dilution Interface: It allows the least amount of sample reaction or loss of any other sampling component. Direct Interface collects the gas sample directly from the stack. Dilution Interface does the same, but is used in cases with extremely high concentrations of the target compounds.

Absorption Tube: The old Method 18 listed charcoal as the approved absorbent and implied it was the only one that could be used. Now any absorbent on the market can be used. This technique should be used for sub-ppm levels.

Bag Sampling: This is a cheap technique that does not require a GC unit onsite. In addition, the large bag allows multiple analysis. If there is a risk of explosion in the sampling area, this technique should be used.

Ms. Dishakjian next discussed the changes made to Method 18 when using direct or dilution interface. The definition of a run has been changed for direct interface; previously a run required two consecutive injections into the GC that matched to within 5 percent. This criteria was difficult to meet for processes that are variable. The calibration gas requirements now specify three injections with

three concentrations of each target compound. The new requirement requires the use of a calibration gas certified by the manufacture to ±2 percent. Method 205 is allowed as the gas dilution verification procedure so testers will not be caught in the field with the wrong calibration gas.

She then described the recovery study for direct interface as basically a leak check with a 70-130 percent recovery. Basically the GC is calibrated and then the calibration gas is run through the probe to check for the same response on the instrument. She mentioned that the requirement stating two consecutive samples have to be within 5 percent has been deleted. A complete run now consists of five consecutive samples. Fifteen samples (3 sets of 5 consecutive samples) are considered the three runs needed for the compliance test. The post-test calibration check consists of injection of one level of calibration gas. If there is greater than 5 percent difference between the initial and final calibration, then another calibration curve is required. In this case, the average of the pre- and post-test calibrations is used to get the final number.

Ms. Dishakjian stated that for absorption tube sampling, any commercially available absorbent is allowed. The source can also use a water knockout impinger before the absorbent but, in this case, the impinger and the absorbent in the recovery check must be spiked. In addition, dual trains must be used- one spiked with the target pollutants and the other unspiked. The trains must be sampled simultaneously and used in all three runs. In order for the test to be valid for that source, the spike recovery of one train must be within 70 - 130 percent of the other. The results of the test need to be corrected based on the recovery study. For example, if the recovery is 70 percent, the results of the test would be increased by 30 percent. If the test does not achieve the 70 - 130 percent recovery, then another analytical technique must be used. Desorption of the absorption tube is performed in the lab and can be either solvent or thermal. Basically with solvent desorption, the solvent goes through the absorbent and releases the target compounds. The desorbed liquid allows multiple injections to be performed. With thermal desorption, each sample can only be analyzed once.

Ms. Dishakjian stated that the evacuated container is the most common bag sampling technique. In addition, other sampling methods allowed include a direct pump sampling method where a teflon pump is run between the bag and the stack; an explosion risk procedure, which uses two evacuated containers in a series; and a heated container option, which is used if water condensation is expected in the bag during sampling. The 70 - 130 percent recovery rate also must be achieved with this technique.

Ms. Dishakjian concluded that the Method 18 revisions allow flexibility in choosing sampling/analytical methodology as long as the recovery criteria of 70 - 130 percent is met. However, EMC encourages the Direct/Dilution Interface technique because of the real time data and less chance of sampling losses. In addition, any detector may be used, including mass spectrometer. Any absorbent is allowed as long as the recovery criteria is met. She noted it is important to remember that the recovery procedure is done only once per source as long as the matrix does not change and Summa® canisters are only allowed during presurvey sampling.

Question: If you had 130 percent recovery, does that mean you would adjust the results down by 30 percent?

Answer: Yes, that is correct. It works the same as if you showed 70 percent recovery. In this case, you would adjust all the results up by 30 percent.

Question: Is the certified gas used for direct interface recovery or calibration curve?

Answer: You must use certified gas (that is, 2 percent) for any sampling procedure.

Question: Is the fact that Method 18 is listed in the latest CFR as Method 17 an oversight?

Answer: Yes, it is listed as Method 18, but the headings in the CFR identify it as Method 17.

♦ PRESENTATION 12 ♦

Predictive Emission Monitoring Systems
Performance Specification 16
Foston Curtis, EPA, Emission Measurement Center

Foston Curtis was scheduled to speak about PS-16, which is the next performance specification for PEMS. However, because little progress has been made on developing this PS, Mr. Curtis addressed the precursor to PS-16—the draft PS developed in the mid-1990s under the old enhanced monitoring rule. This draft PS is posted on the EMTIC web site and a copy is included in the workshop notebook. Mr. Curtis indicated that these draft specifications should be used to validate PEMS. A PEMS system is a predictive system, which predicts an emission rate based on input parameters of a process, as opposed to direct measurement of emissions using an instrument such as a CEM. EMC's plan is to promulgate this draft PS and publish it in the CFR.

Mr. Curtis next provided a historical review of the development of monitoring tools. In the early 1970s, when EPA first promulgated emission standards, reference methods were relied upon to determine compliance with the emission standards. Instrumental methods were then developed as a means of determining compliance. Advantages of instrumental methods over the previous methods were that they provided real time and continuous data. Initially, instrumental methods were used for determining the operation and maintenance parameters of control devices, such as during periods of excess emissions. As these systems proved to be reliable, they were ultimately used to determine compliance with the emission standards. EPA is now at another crossroads with the development of the PEMS. These are cheaper to install and cheaper to operate.

It is anticipated that the application of PS-16 will be as an alternative to current CEM monitoring requirements. The provisions in parts 60, 61 and 63 currently allow the use of alternative methods. EPA is also evaluating PEMS as an alternative to CEMS in the MACT regulations that are currently under development. The pharmaceutical MACT standard that has been promulgated contains a PEMS for monitoring organics from condensers. PEMS can also be used in applications under State and local rules. Mr. Curtis mentioned Texas, South Coast, Arkansas, Oklahoma and Pennsylvania as examples of States that have adopted their own PEMS policies or procedures. Mr. Curtis stated that PEMS are proceeding as a viable monitoring tool. He expects to eventually receive a number of petitions to use PEMS instead of CEMS.

Mr. Curtis outlined the two general types of PEMS. The first type uses equations based on physical principles such as thermodynamics, ideal gas law, etc. The second type is based on regression analysis with historical data, which involves training the computer model to develop the personality of the process. The first type is quite reliable, although some errors occur as a result of the assumptions that are required to solve the complex equations. The second type is accurate over the long run as long as the sensors operate at the same range as reflected in the historical data.

In developing PS-16, EPA intends to use data that is currently available, including: (1) data collected as part of the acid rain program (40 CFR 75, subpart E); (2) TNRCC specifications for PEMS allowed under the NO_x RACT rules; (3) prior PEMS certifications (for example, the subpart DD boiler PEMS in Region 10); (4) the Region 1 International Paper study; and (5) future acid rain studies.

The draft protocol on the website is almost a copy of PS-2. The initial performance requirements will require 20 percent relative accuracy and a minimum daily sensor check for failed sensors. It will also include a test to determine the PEMS ability to use substitution data. The general measurement location specifications for PEMS are very similar to those for NO_x and SO_x in PS-2. The sensors must be in accessible locations and the reference methods and the RATA must follow the same criteria as PS-2. The relative accuracy test is essentially the same as that in PS-2. It requires a minimum of nine comparison runs at three parameter levels (that is, high, medium and low concentration range). Particulate PEMS will require a minimum of 15 comparison runs. The range of operation of the sensors during the relative accuracy tests defines the operation envelope of the PEMS. The relative accuracy calculation remains the same as PS-2. The second test that PS-16 requires is the daily sensor check to identify failed sensors. This test must be done at 75-100 percent of the emission standard and must identify the sensors, or combination of sensors, which cause the model to produce an emission rate that is off the emission standard by 20 percent or more. This daily sensor check could be any check to ensure that the sensors are working properly. Examples of such checks include a visual check of the outputs, a sensor set point test, or the use of a diskette containing sensor values to evaluate if the model can generate the correct emissions data. The third test involves an evaluation of the PEMS ability to use substitution data that is within 20 percent of the correct data.

Mr. Curtis next summarized some concerns associated with the draft PS-16. These include whether more relative accuracy data points are needed; whether the PEMS owner or operator should submit mapping data used to develop the PEMS; and whether F-tests, t-tests and correlation tests of relative accuracy test data should be required. A comparison of the initial certification requirements for PEMS in PS-16, the acid rain program and the Texas program was also presented. The most critical issue is how well the PEMS will operate over time. EPA intends to develop a QA procedure that provides guidance on periodic testing of the PEMS to ensure continued reliable data. In addition, EPA is examining the frequency at which audits should be conducted, developing provisions to allow a lesser frequency for superior performance, and using reconciled data.

Mr. Curtis indicated the tentative schedule has proposal by June 2000, and promulgation by March 2001.

Question: The Acid Rain CEMS generally have relative accuracies in the single digit range, so why should we accept 20 percent RA for PEMS?

Answer: PEMS is a new technology and when CEMS were first regulated with PS-2, the RA level was set at 20 percent. Also, Acid Rain is for a different purpose. In a recent

evaluation the Region 10 PEMS certification achieved a 8-9 percent RA level, but it is not reasonable to impose this on all PEMS applications. However, this will continue to be examined and can be revised if the technology improves to where it can consistently meet a more stringent RA.

Question: Does EPA allow replacing CEMS now used for NSPS compliance? For example, subpart Db requires continuous compliance for sources greater than 250 MMBtu/hr.

Answer: PEMS are not applicable to all situations, but if you can meet the performance specifications and the QA requirements, it should be acceptable. However, replacement of a CEM used for compliance requires OAQPS approval.

Question: Why must we do a 30-day RATA comparison test on a PEMS in the acid rain program when it is not necessary? Does the increased accuracy of the long test justify the cost?

Answer: The subpart E requirement is meant to cover more than PEMS. The 720 hour demonstration is adequate from a statistical point of view. The acid rain program is a market-based system and needs to be as accurate as possible.

Question: We are encouraging new technologies but not holding them to the same level of the current technology that is reflected in the Acid Rain RATA requirements. The commenter also noted that Appendix E for peaking units under the acid rain program is sort of a PEMS. Another concern is the inability to challenge PEMS results with an independent measure. It can only be challenged with a RATA. Should RATAs be done more frequently (that is, quarterly instead of annually)?

Answer: This is a very good point that needs consideration. Texas and the acid rain programs require repeated RATAs after 6-months. In the IP study, IP is leaving the CEMS on for 6 months while operating the PEMS. This should give some valuable information on how these things track with time.

Question: How will you handle start-up, shutdown and malfunction?

Answer: This will vary from rule to rule, but normally these activities are exempt.

Question: The idea that startup, shutdown and malfunction is exempt is disturbing. There are many reasons that startups, shutdowns, and malfunctions occur. The source should not be exempt from meeting emission limits during startup, shutdown, and malfunction in all cases. There is a need to specify what is acceptable.

Answer: These criteria are spelled out in the regulations and not in the performance specifications.

Question: Some of the NSPS require CEMS where startup, shutdown and malfunction is included in the averaging time.

Answer: That is correct.

Predictive Emissions Monitoring Systems
International Paper XL Project
Chris Rascher, EPA Region 1

Mr. Chris Rascher stated that he would address the following topics in his presentation: (1) the XL program and the associated process; (2) the IP XL project; (3) the results of the pilot project on the lime kiln; and (4) the final steps of the IP XL project.

Project XL, which stands for excellence in leadership, is a national regulatory reinvention program. Under XL, a regulated entity (that is, company) sponsors a project that results in an enforceable commitment to achieve better environmental results than would be attained through existing regulations. It generally involves less compliance costs and offers more regulatory flexibility than traditional regulations. XL is an experiment proposed by a regulated entity and will not directly lead to a change in regulations or policy. As such, the project will not establish a precedent for other facilities. The major components of Project XL include the following.

A proposal submitted by a company that contains a conceptual description of the project.
A final project agreement or work plan that contains a detailed description of the project including EPA and stakeholder input, Federal Register notices, and site specific rules. All parties must agree with and sign the final agreement.
Implementation of the project. Of the 50 or so XL projects in the pipeline, only about 10 of them have started.
Review of the completed project. These projects can last anywhere from 3 to 10 years.
The XL project may, in some cases, lead to a new rule or a change in an existing rule.

In deciding if a proposed XL project will be selected, the environmental results, stakeholder support, cost savings to the company, and paper work reduction are the most important factors considered. Other factors considered include innovation, multimedia applicability, transferability, feasibility, monitoring reporting and evaluation, and shifting of risk burden.

Mr. Rascher next explained IP's proposal for an XL project. IP proposed to develop a PEMS for the waste wood fuel incinerator at their integrated pulp and paper mill located in Jay, Maine. In the production of paper, the facility generates waste bark that is used in the WFI, along with waste paper and other waste material, to generate steam for the facility. The WFI is rated at 480 MMBtu/hr and emits 210 tons PM per year. The facility employs 1200 employees and has five permitted stacks. The PEMS is primarily for PM, but would also include SO_2, NO_x and steaming rate. The concept is to correlate steaming rate to emission levels. If the project is successful, it would reduce requirements for PM stack testing, which is currently required once every 2 years. One benefit of the PEMS would be that the emissions would be known for every day of operation compared to the current approach of quantifying emissions once every 2 years. The facility would also like to remove the SO_2 and NO_x CEMS if the project proves successful. IP's proposal also contained a condition that would seek EPA approval for conditional calibration allowances during the development and

testing phases. The State of Maine supported this concept although EPA required that no NAAQS could be exceeded during the developmental and testing phases.

The IP XL project would demonstrate the capabilities of a PEMS to provide continuous information on emissions and process information. It would also provide increased information on PM emissions and the reduced risks associated with those emissions. The goal of the project is to reduce PM emissions by 10 percent. The benefit for SO_2 and NO_x is not as well defined as it is for PM; however, it must be remembered that the project is designed for PM.

IP's main reasons for proposing this XL project are to get more information on PM emissions and obtain significant operational data (that is, steaming rate). Mr. Rascher noted that the XL project may be the best federal mechanism for developing the PEMS. The project would improve the current monitoring. Monitoring limitations include the fact that stack tests are performed once per year and that frequent stack testing is cost prohibitive. The moisture in the stacks makes opacity monitors highly inaccurate and PM CEMS provide emissions data, but will not provide feedback on the operational parameters impacting emission rates. Furthermore, the facility uses a number of different types of fuels, which impacts the operation of the CEM.

The PEMS model being considered is an advanced neural network to predict emissions from process operating data. This is opposed to a model that uses regression analysis. To date, no PM PEMS has been developed for such a complex source; they have, however, been developed for simpler, less complex sources. The model is designed to result in an accurate prediction of pollutant emissions on a continuous basis. It will also identify optimal operating conditions and contain alarms to notify potential exceedances immediately.

The pilot project that was conducted as part of the XL project was performed on 2 lime kilns. Six-hundred modified Method 5 samples, taken every 15 minutes, were conducted to collect PM data. CEMS were used for the other emissions (TRS, SO_2, NO_x, CO and CO_2). Operational data, such as kiln temperature and air flow, was collected from IP's operating computers. IP also measured data manually, including lime mud chemical analysis, wet scrubber flow data, meteorological data and fuel analysis. In all, 54 operating parameters were identified and 580 data sets were sampled. Data was collected for 14 hours per day for a period of 25 days. Over 250 Megagigs of raw data were collected and fed into the model. A series of three sets of relative accuracy tests were then performed. The first test was a quick validation for PM to see if the model comes close to predicting the actual levels. The results showed that the model came close to predicting the correct values, but it did not pass. After some adjustments, a large validation effort was conducted for 50 samples and the model failed miserably. As a result, IP looked at all the data that had been collected and discovered that the probe for measuring pH was at the wrong location. They relocated the pH monitor to a better location and reran the model based on the new data. The validation of the new model did pass; however, there were some questions about the appropriateness of doing this. Consequently, another relative accuracy test was conducted and showed a strong correlation between the modeled and measured results (8.3 percent RA). With the PEMS operating, IP can look at lime availability (an indicator of the quality of the product) and PM emissions and adjust controls to

optimize both. The facility previously emitted 17 pounds PM per hour and is now at 8 pounds PM per hour. The fuel firing rate has also been reduced.

A number of issues remain to be resolved. These include how often RA should be conducted in order to evaluate the accuracy of the PEM over time. Annual, semi-annual and quarterly RAs are being considered, as well as using CEMS to periodically check on the PEMS. Other options being considered are to temporarily install CEMS or installing CEMS for a period of a few years to check on the PEMS. Mr. Rascher also mentioned the concept of a "Gold Disk" for use by inspectors to confirm accuracy of the PEM. The sensor validation system and its accuracy is another issue.

Mr. Rascher concluded by outlining the final steps of the IP XL project. These include developing a final project agreement, which has been under development for a number of years and requires involvement of all stakeholders; developing a sampling and validation plan; and identifying and preparing legal mechanisms. Once the agreement is completed, testing will be performed to collect data for the model. Next, the model will need to be validated (RATA tests) and if validation is successful, the existing stack testing and CEM requirements would be reduced, most likely, through a SIP revision.

Question: Why did you use Method 5? It measures PM, not PM_{10}.

Answer: Method 201A can't be used in a wet stack. In a wet stack, Method 5 will give you the PM_{10} measurement.

Question: Could you have picked an easier source?

Answer: There are two power boilers on site that would have been easier to develop PEMS for. However, the facility is building a natural gas-fired CoGen facility and the boilers will be shut down. The goal of the PEMS is to include all factors that may significantly impact emissions under normal conditions. It is a complex source with multiple variables.

Question: Are they monitoring oxygen at the cold end of the kiln?

Answer: No, only air is being measured.

Question: Is the waste fuel incinerator the same as a waste bark burner?

Answer: No, it is also called a hog boiler.

♦ PRESENTATION 13 ♦

Methods for Measuring Opacity 203A, B, C Now or Ever?
Peter Westlin, EPA, Office of Air Quality Planning and Standards

Mr. Westlin discussed a brief history of the method, the proposed changes, and the possibility of adding additional methods to the list. He stated the method was originally proposed in 1986 because many State and local standards for opacity limits were different than the measurements described in Method 9. The main differences included different averaging times, time exception limits, or no averaging times at all. These differences led to a proposal for adding Appendix F-1 to the CFR part 52. The purpose of proposing Appendix F-1 was to provide procedures and to make them requirements in part 52. For example, if a State standard did not have a method for measuring and reporting visible emissions observations for the standard that was different from Method 9, then one had to use the procedures in Appendix F1.

The method was reproposed in 1993 and put in part 51 instead of part 52. In addition, Appendix F-1 was divided into the following three test methods: 203, A, B, and C. Method 203 requires continuous opacity monitoring systems and A, B and C rely on visible emission observers. In addition, procedures for measuring visible emissions of fugitive dust were added. The accuracy discussion that came out of the 1986 studies was also included. In order to get a greater number of data points for a short term average, 5-second readings were recorded to see if the accuracy was affected. The results indicated that 5-second readings were possible. The accuracy showed the same results as were obtained with 15-second readings.

Method 203A includes language required for certification. It addresses fugitive dust procedures, including where to position yourself, where to look in the plume, etc. A visible emission data collection form is also included to assist with data collection. Language is included documenting visible emissions observation procedures, which include an additional part of visible emissions observation certification that focuses on how to do fugitive emission tests.

Method 203B includes calculation procedures for time exception standards. This method requires 15-second readings over a 1-hour period with an aggregate less than the standard. Method 203C consists of instantaneous opacity measurements. Instantaneous opacity is defined as "a one-minute average." The proposal includes an option to use 4, 15-second consecutive readings to calculate a 1-minute average or 5-second readings.

Mr. Westlin next discussed what the Method will look like when it is promulgated. The method will be put in plain English and it will be in EMMC format. In addition, he stated the requirement allowing 4, 15-second readings for instantaneous limits in Method 203C will be deleted. He also stated that language will be included in regard to training for the fugitive dust observation requirement.

Mr. Westlin ended his discussion by introducing other useful tools for observing visible emissions. PM CEMS are useful in situations where stack emissions are extremely low. Other useful tools include triboelectric detectors, fenceline COMS and CEMS, and tricorders.

Question: Mr. Westlin asked whether EPA needs to develop another visible emissions method that would be used when there was a continuous opacity limit (for example, less than 10 percent) or a requirement that there be no visible emissions. The method would be 203D.

Comment: The only application Region 10 has been involved with along this line is the recent federal implementation plan written for FMC in Idaho. There are numerous visible emission requirements. Because there was no method, Region 10 used terminology to emphasize that it is not Method 9 or another similar method. In the past Region 10 cited relevant sections of Method 22. Region 10 stated that there would be some value in developing a 203D to cover scenarios described above.

Comment: Missouri enforcement section does not recommend placing Method 22 in operating permits. Instead, Method 9 observations are initiated if a plume is visible. The owner/operator must conduct Method 9 observations on a prescribed schedule until the plume disappears. For example, the owner/operator must conduct Method 9 observations every 24 hours until the plume disappears. After the plume disappears, the Method 9 observations must be conducted every 24 hours for a two-week period.

Comment: Method 203D would be helpful.

♦ QUESTION AND ANSWER/DISCUSSION SESSION ♦

Day Two Topics
Moderator: Rima Dishakjian

Question: A State representative asked if any States in attendance require that condensable PM be measured for any reason.

Answer: The State of Montana requires that the back-half of the train in Method 5 be used to demonstrate compliance with their process weight regulation. The contact is Pat Driscoll [(406) 444-0284].

The State of New Jersey requires Method 202 for PM-10 sources after the date of promulgation of the method (that is, February 17, 1991). Sources permitted before then are considered grandfathered. It is New Jersey's interpretation that part 51 defines PM-10 to include condensables and EPA Region 2 supports this interpretation.

Region 9 stated that California includes condensables in their method (CARB 5). Cindy Casternova is the contact.

The State of Missouri addresses this in the same manner as the State of New Jersey does. Anytime there is a compliance test that involves PM-10, the test automatically includes the condensables. This requirement is cited in many recent construction permits issued within the State. Randy Raymond is the contact.

The State of Pennsylvania requires condensable PM-10 where there is an out-of-stack PM-10 requirement or for modeling. They also stated that, in practice, they are not sure that this is being done.

The State of Iowa has the same requirements as Missouri does. Mark Stone is the contact.

The State of Minnesota requires analysis of the back-half of the train for organics on industrial processes. Stuart Arkley is the contact. [(651) 296-7774]

The State of Kentucky requires that any source not under an NSPS and that impacts a nonattainment area must test for condensables (basically Roger Shigahara's old incinerator method).

Question: Who is the EMC contact for mercury testing at electric utilities?

Answer: Bill Grimley is the contact for reviewing test plans and Lara Autry is the contact for the review of the QA plans.

Question: Will testing be QA'd by the States or Regions?

Answer: The test schedule is posted on the Internet at www.utility@rti.org. Interested individuals should refer to the web site.

Question: Will the data be available to State and local agencies?

Answer: Yes, it will be posted on the web site.

Question: Will this program lead to mercury CEMS?

Answer: It probably will if EPA makes a positive determination that mercury emissions from electric utility plants should be regulated.

Question: Given the problems identified with field sampling, is there any provision for site observation or accreditation for data generated that will be used as the basis for developing MACT regulations? In other words, are there any plans for requiring accreditation of the people that observe these tests?

Answer: Probably not, principally because the data used to support MACT development comes from many sources.

Question: Two wastewater treatment plants were recently permitted and were required to identify all the HAP compounds in the wastewater. Are methods available to identify all HAPs and where can one find a listing of such methods?

Answer: Yes, see the report *Screening Methods for the Development of Air Toxics Emission Factors* (EPA-450\4-91-012).

Question: It is difficult to run Method 201 A.

Answer: It is difficult, however, we are trying to break methods into more useable versions on the web site.

Question: Have other States seen this problem with how the test performed using Method 201A?

Answer: The Method 201 A validation data looks acceptable, so EPA does not have a problem with it.

Question: If source testing firms are required to be certified by NELAC, will the State and local agency staff who will review and approve compliance test protocols also be required to be NELAC certified?

Answer: Not as NELAC is currently written, but it under consideration and EMC would welcome input on this issue. Region 7 stated that their staff will be certified so that their testimony in legal challenges can be upheld.

Question: With the reporting of bad practices by accredited testing firms, how will the actual penalty apply for companies that are accredited out of State?

Answer: This is a national accreditation program. Chapter 4 of the NELAC standards deals with denials, revocation and suspension of accreditation. The State agency observing the bad practice would be required to prepare a corrective action report and, if NELAC is not satisfied with the testing firm's response to the corrective action plan, they can revoke the accreditation and it would apply in all States, not just the State in which the firm was accredited.

Question: What sort of tracking mechanism is foreseen?

Answer: Each State will need to decide on this. Checklists and surprise inspections are some of the techniques that could be used. However, NELAC would have the responsibility of tracking, documenting and reporting the findings.

Question: Would the list of discredited testing firms be available to States?

Answer: Yes, there will be a national database with the data from all accredited testing firms.

Question: Five to seven years ago there was a push for observers being certified. It required that observers have testing experience in the past. However, requiring NELAC certification would severely limit the number of observers that would be available.

Answer: However, on the other hand, there are many observers who ask testing firms to do too many stupid things and there is need to improve the quality of these types of observers.

Comment: The training aspect is very important because many of the staff have no experience. The State of New Jersey trains new observers and pairs them with an experienced observer for the first year or so.

Comment: The State of Florida spent $75,000 for a contractor to provide specialized training. In addition, everyone in the testing group goes to the EPA 450 course and receives

adequate safety training. We believe this approach is preferable to NELAC accreditation.

Question: Is there a field observation manual available?

Answer: Kirk Foster, who was on the staff of the NC Air Quality Division for many years, wrote a manual on conducting opacity observations. However, it has not been updated for about 10 years.

Comment: The State of Montana stated that they do not have the resources to do the certification.

Comment: The State of Virginia developed checkoff sheets that are taken to the field. These are self guiding and a useful tool to those with extensive testing experience. In addition, EPA's web site (http://www.epa.gov/ttn/uatw/hon/honpg.html) has information for inspector checklists. Can EPA develop inspection checkoff sheets with emphasis on the critical aspects of a test?

Question: Is EPA developing gas compressor portable monitor protocol?

Answer: No, however, EPA is accepting comments on a portable gas analyzer proposal developed by an industry group. This proposal can be found on the EMC web site under conditional test methods (http://www.epa.gov/ttn/emc/ctm.htm).

♦ NOVEMBER 4, 1999 ♦

♦ PRESENTATION 14 ♦

Continuous Monitoring Session
U.S. EPA's Evaluation and Applicability Determination Process for PM CEMS
Dan Bivins, U.S. EPA Office of Air Quality Planning and Standards

Mr. Bivins explained EPA's evaluation of PM CEMS, including how data can be used in the future, and what is expected for PM CEMS in future regulations. PM CEMS are expected to replace Method 5 for measuring $PM_{2.5}$. They may also be used in the future in lieu of opacity limits and as a surrogate measure for HAP metal compounds. Current EPA work is designed to address performance specification issues. At present, EPA has completed proof of concept and gathered information from other tests.

Mr. Bivins also explained Germany's evaluation and applicability determination process. In Germany, organizations evaluate instruments in the lab, make a judgment call on its applicability to that type of source and then deem it usable at that type of source only. Then the organization takes it to the facility and tests it for accuracy, places a seal on it and states the instrument is approved for use on this source at this site. In contrast, the U.S. uses performance specifications, giving flexibility of instruments to use.

Mr. Bivins reported that EPA currently has three PM CEMS installed on a coal-fired boiler at a power plant. Present results indicate a successful correlation test of the three PM CEMS, but a final audit is scheduled for December. He stated a draft report will be available in the spring. In addition, the DOE is evaluating a test at an incinerator at Oakridge Laboratories. Eli Lily & Company also performed a test last year on a wet incinerator. The results of this test indicated that the instruments performed according to the performance specifications.

Mr. Bivins cited the following reasons why PM CEMS would be of value to industry.

Great communication tool
Alternative to more onerous testing
PEMS development savings
More efficient control device maintenance
Process optimization and resource conservation
Learn how to become compliant with more stringent air pollution standards

In summary, Mr. Bivins stated the costs for PM CEMS range from $100,000 to $200,000. Historically, CEMS have only been required at large industrial facilities. PM CEMS are useful to EPA for compliance assurance, as a surrogate monitor for metal HAPs, and for an alternative to opacity monitoring.

Question: How many States require the use of PM CEMS?

Answer: None at present.

Question: Could you talk more about the European experience? Don't they treat results of PM CEMS very differently than we do for enforcement purposes?

Answer: Yes, the regulatory agency has a more cooperative relationship with industry. It is not as confrontational in Europe. If a company has an exceedance, the regulatory agency meets with them to determine what happened and why it happened instead of coming down hard with an enforcement action.

Another difference between the European nations and the United States is that they have corrective action obligations, reporting obligations, and testing obligations, but don't have automatic violation situations. The regulatory agency will take corrective action only if continuous violations are noted. In addition, they take a more active approach to letting the public know how the facility is operating. Some companies have large display boards outside the facility showing current emissions.

Question: Can PM CEMS be used on wet stacks?

Answer: Two types of monitoring equipment can be used. One is a beta gauge. It extracts the sample isokinetically, heats it up, and places the PM on paper tape. Rays are then shot through the tape for PM determination. The second type is a Swiss instrument that extracts PM, condenses the water out and then sucks the gas into a cell. A light beam is then shot at the cell and the reflected light back is an indication of PM.

Question: A lot of data that has been collected indicate that emissions are really condensables and not filterable. How would that be accommodated in PM CEMS?

Answer: That is definitely a concern at cement kilns. We will have to see if that's a problem in the future. There is still a lot to learn about PM CEMS

Question: Have you looked into installing PM CEMS at International Paper?

Answer: There are a lot of variables to consider at a waste fuel incinerator. The IP waste fuel incinerator has multiple fuel sources with a saturated stack. It is understood that change in fuel types can affect PM CEMS readings. IP has actively looked for PM CEMS. They have met with vendors but no equipment has presently been identified. IP would love to have a PM CEM, but the technology is just not there.

New MACT Monitoring
Barrett Parker, EPA, Emission Measurement Center

Barrett Parker indicated that EPA developed a policy on February 6, 1998, to address monitoring requirements listed in the MACT rules. EPA felt the need to standardize or categorize the way monitoring is approached in the MACT rules. In addition, EPA wished to strengthen MACT monitoring to assure continuous compliance in accordance with the CAAA, and to also assist OECA in their compliance and assurance activities.

Under the new approach, data are used to determine, not indicate, compliance with the emissions or operating limits. The standards must specify the averaging periods and the calculation procedures, as well as QA/QC requirements, either individually within each standard or in an appendix or a performance specification. QA/QC is particularly critical for CMS and can be used to identify the process operating conditions that should occur either during normal operation of the facility or during performance testing.

Mr. Parker discussed the four tiers in the top-down monitoring selection process, with Tier I as the highest standard. The tiers are characterized by the means used in the measurement and the type of standards the tier includes. The MACT rule writers can consider both technical and economic factors. For example, if the costs associated with a Tier I monitoring approach is too expensive, the rule can be written to require a Tier II monitoring approach.

Tier I monitoring is used in rules that contain an emission limit and state that CEMS are to be used to determine ongoing compliance. A rule containing Tier I monitoring should equate an exceedance of the emission limit as a violation of that limit, although excused excursions can be identified in the rule. Tier II monitoring should be used for rules that contain an emission limit and states that CEMS (or surrogates) or CPMS are to be used for determining ongoing compliance. A rule containing Tier II monitoring should equate a surrogate pollutant exceedance or deviation from an established parameter level as an emission limit violation. Excused excursions are also identified in a Tier II rule. Tier III monitoring should be used in rules that contain emission or operating limits and state that CEMS for surrogate parameters or CPMS are used to determine compliance. A rule containing Tier III monitoring should equate a surrogate pollutant exceedance or deviation from an established parameter level as a violation of an operating limit, not an emissions limit. Excused excursions are also identified in a Tier III rule. Tier IV monitoring should be used in rules that contain operating limits and states that monitoring is a means for initiating corrective action. A rule containing Tier IV monitoring should equate a failure to conduct monitoring or take action as a violation of an operating limit, not an emissions limit. All MACT rules issued after February 1998 are to contain these monitoring requirements.

Next, Mr. Parker examined the Pharmaceutical MACT standard with the tiered monitoring approach. The Pharmaceutical MACT standard is codified at subpart GGG of 40 CFR part 63. It was promulgated on September 21, 1998, with the compliance date three years after promulgation. The

rule affects approximately 101 facilities, mostly located in the States of New Jersey, California, New York and Puerto Rico. The rule is estimated to reduce HAP emissions by 24,000 TPY with the majority of the reduction coming from methylene chloride, methanol and toluene. The standards apply to storage tanks, process vents, equipment leaks and wastewater operations at pharmaceutical manufacturing facilities. The rule contains an alternative standard, which relies on CPMS, and the preamble states that compliance is shown through continuous direct or parametric monitoring.

Mr. Parker then identified those control technologies that could be used at pharmaceutical facilities to comply with the subpart GGG regulation. Mr. Parker stressed that many portions of the Pharmaceutical MACT are derived from previously promulgated regulations affecting other industries. Many of these rules predated the February 1998 policy and, therefore, may not comply with the tiered monitoring approach. Mr. Parker explained that the monitoring techniques will vary from control device to control device and can include conducting inspections or measuring parameters such as temperature, pressure, flow rate, flame presence, BOD, etc.

Mr. Parker evaluated the pharmaceutical MACT with the required rule components to determine which monitoring tier should be in the regulation. The rule contains an explicit compliance determination statement and QA/QC requirements for initial compliance and for those monitors subject to promulgated performance specifications. There are, however, no QA/QC requirements for flares and carbon adsorbers. The rule does not define the process operation for continuous operation, but does define it for batch processing (that is, it must be done at hypothetical or worst-case conditions). The rule does define the initial and ongoing averaging times and contains complete calculations and equations. The rule also identifies excused periods for certain storage tanks and equipment leak conditions.

Next, Mr. Parker examined how well the rule implemented the monitoring tiering policy in its provisions for process vents, storage tanks, equipment leaks and wastewater. These comparisons are shown in the following tables.

PROCESS VENTS

Control	Pollutant/Parameter	Monitoring Device	Exceedance/ Excursion violation of	Tier
Non-condenser, Non CEMS, Non-alternative	Flow rate, pressure drop, pH, and temperature flame presence	Continuous flow rate, pressure drop, temperature, and pH monitors	Operating limit	III
Condenser	Outlet temperature	Continuous temperature	Emission limit	II
CEMS	Outlet HAP	CEMS	Emission limit	I
Alternative Method	Outlet TOC, Outlet hydrogen halides and halogens	CEMS	Emission limit	II

STORAGE TANKS

Control	Pollutant/Parameter	Monitoring Device	Exceedance/ Excursion violation of	Tier
Non-condenser, Non CEMS, Non-alternative	Flow rate, pressure drop, pH, and temperature flame presence	Continuous flow rate, pressure drop, temperature, and pH monitors	Operating limit	III
Condenser	Outlet temperature	Continuous temperature	Emission limit	II
CEMS	Outlet HAP	CEMS	Emission limit	I
Alternative METHOD	Outlet TOC, Outlet hydrogen halides and halogens	CEMS	Emission limit	II
Floating and non-floating roof	Undefined	Undefined	Undefined	NC

EQUIPMENT LEAKS

Control	Pollutant/Parameter	Monitoring Device	Exceedance/ Excursion violation of	Tier
---	VOC	Periodic inspections with visual, audible or olfactory checks and detection instruments	Undefined	NC

WASTEWATER

Control	Pollutant/Parameter	Monitoring Device	Exceedance/ Excursion violation of	Tier
Tanks, Surface Improvement, Containers, Individual drain systems, and oil/water separators	Seal integrity	Periodic Visual Inspection or Measurement Checks	Undefined	NC
Biological Treatment Unit	TSS, BOD, Biomass concentration	Undefined	Undefined	NC
Enclosed Combustion Device	Undefined	Undefined	Undefined	NC
Vapor Recovery System	Undefined	Undefined	Undefined	NC
Incinerator, Boiler, Process Heater, Carbon Adsorber, Flare, Scrubber	---	Undefined	Operating Limit	III
Condenser	---	Undefined	Operating Limit	II

NC = Not classifiable

Mr. Parker concluded that the pharmaceutical MACT should be graded as follows for its adherence to the MACT monitoring guidance issued in February 1998. The process vent provisions receive an "A," storage tanks receive a "C," and equipment leaks and wastewater receive an incomplete. EMC intends to play a more active role in developing monitoring provisions for the MACT standards that are still under development.

Question: Can you explain the performance specification tools in Appendix F and how these relate to these CEMS?

Answer: Many have viewed Appendix F as the end all/be all for CMS. However, not all the CMS in use today are included in Appendix F. One of the tasks currently being undertaken by EMC is to write a PS for those CPMS. They will also include QA/QC for CPMS.

Question: Have you graded the pulp and paper MACT cluster rule? Non-combustion sources covered by this rule need to be examined.

Answer: No, we have not done this.

Question: Have you thought about revising Appendix F to require linearity on gas monitors rather than just shooting a couple of gases? Then it would be consistent with the part 75 linearity requirements.

Answer: EMC has not considered this, but could. However, the part 75 program is a trading program that requires accuracy across the range of measurement and parts 60 and 63 are an emissions standard program where we are concerned about compliance with a number.

Question: When developing a new PS for CPMS, are you going to take into account the high priority violator policy? For example, for chrome platers, the variance is 5 percent over the target range for a mesh pad eliminator. However, this equates to a 1.0 inch pressure drop versus a 1.05 inch pressure drop. This is a very tight range, but it is a violation.

Answer: Yes, they plan to do this.

Compliance Assurance and Title V Monitoring
Peter Westlin, Emissions Measurement Center

Peter Westlin discussed the CAM Rule, which was promulgated a couple of years ago in 40 CFR part 64. In addition, he spoke about Title V monitoring principles and the guidance information that is available.

Mr. Westlin first addressed the recent court ruling regarding CAM. The CAM rule was promulgated in October 1997. It was immediately litigated by the Natural Resources Defense Council and industry. The Court arrived at its decision on October 29th, 1999. The following three issues were involved in the litigation.

- NRDC claimed the CAM rule did not address enhanced monitoring requirements that appear in the 1990 Clean Air Act.

  Court Ruling: Disagreed with NRDC. The CAM rule does satisfy the requirements of the Act.

  The compliance certification language was not sufficient to address the part of the Act that states the owner and operator has to certify as to whether annual compliance is continuous or intermit.

  Court Ruling: The Court agreed that the compliance certification language did not meet specific language of the Act. Part 70 certification language will be revised to say that the source must certify whether compliance is continuous or intermittent over the course of the year.

  Industry, primarily the utility industry, raised the credible evidence issue. The compliance certification language raises stringency issues and makes regulations more stringent than they were when they were promulgated.

  Court Ruling: The Court disagreed. Industry can't prove any incident where EPA has raised the stringency on any standard.

Mr. Westlin stated the monitoring principles for Title V and CAM are identical. Both were developed primarily to raise the level of monitoring for existing sources and to raise the attention paid to control devices. It is a means to ensure the owner/operator pays the same level of attention to the control device operation as they do to the production line.

A PSEU is subject to CAM if it meets each of the following applicability criteria.

Located at a major source subject to Title V

Subject to an emission limitation and has a control device to meet that limit
Has precontrol emissions greater than the major source size threshold.

Mr. Westlin explained exemptions are by rule type, not facility type. The following rules were exempted under CAM because monitoring under these rules is sufficient to demonstrate compliance with CAM.

Monitoring for acid rain rules
Post-1990 EPA rules
Rules with continuous compliance determination methods

The CAM rule does have one exemption for specific source types or control types, which is for municipally-owned utilities.

Mr. Westlin then explained the CAM requirements. The owner/operator can build on current requirements and practices to meet CAM requirements. For each add-on control device, the source owner/operator selects parameters that are related to the correct operation of that device, (for example, firebox temperature for an incinerator). Next, indicator ranges must be established for each operating parameter. Test data should then be used to verify that indicator ranges do provide reasonable assurance of compliance with a specified emission limit.

Mr. Westlin next discussed periodic monitoring. He defined periodic monitoring under the Act as monitoring that generates reliable data representative of compliance for the relevant time period. Periodic monitoring must be conducted for each emission point at a title V major source that is subject to a federal applicable requirement. Federal applicable requirements include those in federal air regulations, SIP requirements, and permit terms resulting from SIP-approved programs. In some cases, the monitoring in the applicable requirement will satisfy periodic monitoring requirements; in others, it may not be adequate. If inadequate, the source can build on its current monitoring practices to meet periodic monitoring requirements. The Agency has developed guidance to define periodic monitoring requirements.

Mr. Westlin stressed that CAM and periodic monitoring requirements are met through the title V permit. The owner/operator must propose the CAM and periodic monitoring provisions that will be included in the title V permit. This information includes a description of the monitoring (what is measured and how), a definition of excursions from the monitored parameters, and a delineation of the QA/QC procedures. In rare cases, such as for some insignificant emission units, it may be appropriate to propose no additional monitoring.

After the owner/operator has submitted the permit application containing the proposed monitoring, the permitting authority must determine if the CAM and periodic monitoring requirements are met. This process includes deciding whether the requirements of each applicable regulation are met, reviewing requirements for units with an add-on control device that are not

subject to CAM, determining if the proposed monitoring will provide a reasonable assurance of compliance, and deciding whether any units may be exempt from monitoring.

EPA has completed a CAM guidance document describing the process of how developing monitoring conditions should work. The document includes a description of the rule implementation process and several case studies. These case studies are useful not only to assist in selecting what parameters are important for a particular control device, but also to give an idea of what kind of data collection and analysis are necessary to justify a certain monitoring approach. The *CAM Technical Guidance Document* is currently available on the TTN for review and comment. In addition, EPA is preparing a periodic monitoring technical reference document. Mr. Westlin stated that a complete document will be posted on the web by the end of November for review and comment. All comments should be sent directly to Peter Westlin at Westlin.Peter@epa.gov.

The State agency must make it clear that they expect industry to operate in compliance with applicable requirements by maintaining control device operations within designated parameter ranges and by responding to all excursions with appropriate corrective action. He stressed that it must be clear that all excursions must be reported to the permitting authority and EPA. Industry must report the duration and nature of corrective action in a semiannual report. Mr. Westlin stated that each State should develop a standard format for the semiannual report and the compliance certification report. A standard format will make the States' job easier and will help the industry know exactly what they need to report. For comparison purposes, he recommends looking at the standard format EPA prepared for part 71.

Mr. Westlin concluded his presentation by discussing the Credible Evidence Rule. This rule is a revision to four sections of the CFR (parts 51, 52, 60, and 61) that allows the source or agency to use information other than compliance test methods to show compliance or violations of applicable requirements. These sections were promulgated in 1997.

There were no questions following this presentation.

♦ PANEL DISCUSSION ♦

Conference Wrap-Up Session
Moderator: Fred Thompson
Panel: Peter Westlin, EPA, Emission Measurement Center
David Mobley, Division Director, EPA, EMAD
Fred Ballay, New Jersey DEP
Paul Boys, EPA Region 10
Robin Segall, EPA, Emission Measurement Center
Bill Lamason, EPA, Emission Measurement Center

Question: Are there PM testing or monitoring issues that you feel EMC should address that are not being addressed?

Answer: Paul Boys stated that the information available from the combination of last year's and this year's workshop was very thorough. However, the New Jersey presentation raised an issue that needs to be addressed. Specifically, resources are needed for stack test observers and EMC should consolidate materials for use by all States. Also, EMC can act as a clearinghouse for studies and test programs conducted by States (for example, Method 25.3 in SCAQMD). EMC should assess these programs and list them on the web site.

Robin Segall responded that EMC is trying to post method development information on the web site and has developed a scheme for such methods. They have established categories from A through E and reserve each category for a specific type of method. For example, Category B is for alternative methods. Categories C, D and E are for test methods for which EPA has varying levels of confidence. For example, Category C is for methods that EPA is fairly confident about, but are not promulgated as EPA methods.

Fred Ballay identified two issues of concern. The first is to provide more information on the validity of PEMS data when it is outside of the normal range. The second issue dealt with requests that they receive for quality assurance of part 60 and part 75 monitoring systems. They can handle this for State regulations, but they need guidance for addressing this for the federal regulations.

David Mobley stated that ammonia from lagoons at animal farms has been a big issue between EPA's Office of Research and Development and the States. There is a need for a measurement method to respond to the changes in emissions. Also, $PM_{2.5}$ fugitive emissions, especially from agricultural and construction sources, are a big concern.

The State of Pennsylvania asked EMC to issue a guidance document addressing when a test can be rejected in the field for Methods 1 - 5. The guidance document should identify both minor and major infractions and provide guidance on how many minor infractions can occur before the test is rejected.

The State of Connecticut stated there should be a session on QA/QC technologies for CEMS. The State of Montana stated that they would like the same thing for organics in Method 18; specifically, guidance recommending approaches for different sources and types of compounds.

The State of New Jersey responded by saying that a program was available on the old EMC web site. The program allowed the user to enter data and receive a recommended collection and analytical technique.

In response to the question regarding Method 18 guidance, Rima Dishakjian stated that if EMC issues guidance it would be too strictly interpreted and would actually restrict testers. She noted that States have a better idea of what works in the field, but EMC doesn't usually hear about these success stories.

Gary McAlister stated that EMC is continuing to work on Method 18 issues. One example is the work being conducted by the New Jersey Institute of Technology that is developing a continuous analyzer for VOC based on Method 18 principles. The method looks promising and has a low detectable limit and better accuracy.

With respect to total VOC sampling, the State of Pennsylvania noted that there are currently three methods available (25, 25A and 25.3), but that each of these is only applicable in certain ranges. They felt it would be useful if Method 25 could be extended to a lower range or Method 25.3 extended to a higher range. Rima Dishakjian responded that she would be interested in hearing any ideas on a method that would do that. EMC has examined this in the past and has not been successful.

The State of New Jersey commented that the test method should be selected based on the permit limit. He has rarely seen a coating operation that doesn't use Method 25, however, industry is raising the destruction efficiency to get below 50 ppm so Method 25A, which gives better results, can be used.

Question: Are there problem-solving activities for which EMC assistance would be helpful?

Answer: Region 10 responded there are no issues at the moment, but provided an example of EMC assistance in the past. The example involved an issue with a subpart Y test at the Aleyska oil terminal in Alaska, which EMC helped resolve. Paul Boys suggested that this type of assistance should be included in the EMC's staff performance standards for their annual review.

David Mobley stated that technical assistance is already a part of the EMC staff's performance standards.

Bill Lamason stated this type of feedback is helpful in assisting with the performance reviews.

The State of New Jersey really values EMC assistance and noted that EMC has provided valuable assistance in the past. He encouraged all to try to work the problem first and then call EMC when you have exhausted all other options. New Jersey also noted that the protocol review aspect of the program could be more efficient and some guidance that summarizes each method would be helpful.

Robin Segall responded to the test protocol review comment by stating that a guidance document is available on the EMC web site. She solicited feedback on this document and whether or not it is adequate.

The State of Florida values the assistance provided by all of the EMC staff, specifically, the web site, technical assistance on difficult problems and evaluating the effectiveness of new technologies. A recent issue that needs to be addressed is the relationship of PS-1 to new opacity monitoring systems.

Question: Are there any other means to share information other than through the web site and conferences?

Answer: Paul Boys of Region 10 stated conference calls scheduled on a regular basis and a listing of such calls on the web site would be useful.

Region 9 felt that satellite broadcasts are helpful and asked if this could be done for other conferences to provide a means to those who could not attend the conference to hear and see the proceedings.

Bill Lamason noted that e-mail groups where established after last year's conference and asked if this should be continued.

David Mobley closed the conference by announcing that Fred Thompson has been named as the Acting Group Leader in EMC for the next year.

APPENDIX A

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