OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Evaluation Report

Additional Analyses of Mercury Emissions Needed Before EPA Finalizes Rules for Coal-Fired Electric Utilities

Report No. 2005-P-00003

February 3, 2005

Report Contributors:

Rick Beusse
Carolyn Blair
Hilda Canes
Sarah Fabirkiewicz
James Hatfield
Erica Hauck
James Huber

Abbreviations

CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CHPAC	Children's Health Protection Advisory Committee
EPA	Environmental Protection Agency
FACA	Federal Advisory Committee Act
OIG	Office of Inspector General
ICR	Information Collection Request
IGCC	Integrated Gasification Combined Cycle
IPM	Integrated Planning Model
OMB	Office of Management and Budget
MACT	Maximum Achievable Control Technology
NTEC	National Tribal Environmental Council
NO_X	Nitrogen Oxide
OCHP	Office of Children's Health Protection
SO_2	Sulfur Dioxide

Cover photo: Virginia Electric Power Company's coal-fired plant at Mt. Storm, West Virginia.
Source: http://www.oag.state.ny.us/press/2000/nov/nov16a_00_pictures.html

U.S. Environmental Protection Agency
Office of Inspector General

2005-P-00003
February 3, 2005

At a Glance

Catalyst for Improving the Environment

Why We Did This Review

Members of the Senate Environment and Public Works Committee requested that we review EPA's development of its proposed rule for controlling mercury emissions from coal-fired electric utilities.

Background

Coal-fired electric utilities represent the largest source of airborne mercury emissions in the United States. Once airborne, mercury can be deposited into water, where it bio-accumulates in fish and animals at the top of the food chain. Human consumption of fish is the primary method of exposure to mercury, which has been shown to cause neurological and fetal developmental problems.

On January 30, 2004, EPA proposed rules for regulating mercury emissions from coal-fired steam generating electric utility units. EPA proposed two options for controlling mercury emissions, one a control technology standard with emission limits and the other a performance based cap-and-trade approach.

For further information, contact our Office of Congressional and Public Liaison at (202) 566-2391.

To view the full report, click on the following link:
www.epa.gov/oig/reports/2005/20050203-2005-P-00003.pdf

Additional Analyses of Mercury Emissions Needed Before EPA Finalizes Rules for Coal-Fired Electric Utilities

What We Found

Evidence indicates that EPA senior management instructed EPA staff to develop a Maximum Achievable Control Technology (MACT) standard for mercury that would result in national emissions of 34 tons annually, instead of basing the standard on an unbiased determination of what the top performing units were achieving in practice. The 34-tons-per-year target was based on the amount of mercury reductions expected to be achieved from implementation of nitrogen oxide (NOx) and sulfur dioxide (SO_2) controls under a separately proposed, but related, air rule. According to EPA officials, 34 tons represents the most realistic and achievable standard for utilities. However, because the results of the MACT standard were prescribed and prior estimates were lower than what was proposed, the standard likely understates the average amount of mercury emissions reductions achieved by the top performing 12 percent of utilities, the minimum level for a MACT standard required by the Clean Air Act. Further, this MACT standard, as proposed, does not provide a reasonable basis for determining whether the MACT or cap-and-trade approach provides the better cost benefit.

The Agency's cap-and-trade proposal can be strengthened to better ensure that anticipated emission reductions would be achieved. For example, utilities would not need to install mercury-specific controls to achieve the interim cap, but could meet the cap by implementing NOx and SO_2 controls associated with another proposed trading program. Also, the proposal does not adequately address the potential for hot spots. Further, provisions for units emitting small amounts of mercury could be improved.

We also found that EPA's rule development process did not comply with certain Agency and Executive Order requirements, including not fully analyzing the cost-benefit of regulatory alternatives and not fully assessing the rule's impact on children's health.

What We Recommend

We recommend that EPA re-analyze mercury emissions data collected for the top performing 12 percent of units to develop a MACT floor. The Agency should also conduct a revised cost-benefit analysis for the updated MACT that takes into account the impact of mercury co-benefits achieved through the proposed Clean Air Interstate Rule. The results of the cost-benefit review should be compared to the cost-benefit of the proposed cap-and-trade option to determine the most cost beneficial option for controlling mercury emissions. We also recommend that EPA strengthen its cap-and-trade proposal by more fully addressing the potential for hot spots; revising the safety valve proposal so that is used only as intended during periods of unanticipated market volatility; and revising the proposed exemption for small emitters. Further, we recommend that the Agency conduct more in-depth analyses of the regulatory alternatives and children's health impacts as required by Executive Orders. The Agency's response to the draft report did not specifically address our recommendations, but raised concerns about certain aspects of the report.

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

THE INSPECTOR GENERAL

February 3, 2005

MEMORANDUM

SUBJECT: Evaluation Report: Additional Analyses of Mercury Emissions Needed Before EPA Finalizes Rules for Coal-Fired Electric Utilities
Report No. 2005-P-00003

TO: Jeffrey R. Holmstead
Assistant Administrator for Air and Radiation

This memorandum transmits the results of an Office of Inspector General (OIG) evaluation regarding the Environmental Protection Agency's (EPA) development of the proposed rule for regulating mercury emissions from coal-fired steam generating electric utility units. This report contains findings that should help EPA in its efforts to develop the final rule. Also, the report contains corrective actions the Office of Inspector General (OIG) recommends. This report represents the opinion of the OIG and the findings contained in this report do not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established procedures.

Action Required

In accordance with EPA Directive 2750, as the action official, you are required to provide this Office with a written response within 90 days of the final report date. The response should address all recommendations. For the corrective actions planned but not completed by the response date, please describe the actions that are ongoing and provide a timetable for completion. Where you disagree with a recommendation, please provide alternative actions for addressing the findings reported.

We appreciate the efforts of EPA officials and staff in working with us to develop this report. If you or your staff have any questions regarding this report, please contact me at (202) 566-0847 or Kwai Chan, Assistant Inspector General for Program Evaluation, at (202) 566-0827.

Nikki L. Tinsley

Attachment

cc: Steve Johnson, Acting Administrator
William Farland, Acting Deputy Assistant Administrator for Science, ORD
Ann Klee, General Counsel
Pete Cosier, Audit Followup Coordinator, OAR
Kwai Chan, Assistant Inspector General for Program Evaluation, OIG
Mark Bialek, Counsel, OIG

Table of Contents

At a Glance

Chapters

1 Introduction 1

Purpose 1
Background 1
Scope and Methodology 8
Results in Brief 10

2 Mercury MACT Development Compromised 11

Requirements for MACT Standards 11
EPA's Process for Addressing Variability in Computation of Mercury MACT Floor 12
EPA Staff Instructed to Develop MACT Floor That Would Result in National Emissions of 34 Tons 13
Conclusions 16
Recommendations 16
Agency Comments and OIG Evaluation 16

3 Cap-and-Trade Option Can Be Strengthened 18

EPA's Proposed Cap-and-Trade Approach 18
Proposed Cap-and-Trade Program Needs to Further Address Certain Issues 19
Proposed Emissions Trading Rule Should Also Address Tribal Concerns . . . 24
Conclusions 25
Recommendations 25
Agency Comments and OIG Evaluation 26

4 Rule Development Process Not Consistent with Expected and Past Practices 27

Description of Rulemaking Process 27
Some FACA Members Considered Job Unfinished 28
Intra-Agency Review Limited 30
Requirements for Cost-Benefit Analyses Not Fully Implemented 32
Required Children's Health Analysis Not Completed 33
Scope Limitations: Inter-Agency Review 34
Conclusions 35
Recommendations 35
Agency Comments and OIG Evaluation 35

Appendices

A Timeline of Events Related to Development of Mercury Rule 37

B OIG's Request for Documents Related to Development of Utility MACT 39

C Different MACT Floor Proposals 43

D EPA's Rule Development Process 44

E Agency Comments to the Draft Report and OIG Evaluation 46

F Distribution 54

Chapter 1
Introduction

Purpose

The Office of Inspector General (OIG) initiated this review based on a request from members of the Senate Environment and Public Works Committee. In their written request, the Senators expressed concerns with the process used to develop the Environmental Protection Agency's (EPA's) January 2004 proposed rule for regulating mercury emissions from coal-fired steam generating electric utility units. The proposed rule included two different options for regulating mercury emissions. One approach was a Maximum Achievable Control Technology (MACT) standard that would establish emission limits applicable to all coal-fired utility units. The other approach was a mercury cap-and-trade approach that would establish a national cap on mercury emissions and allow individual utilities to trade emissions allowances in a market-based system. The objectives of our evaluation were to determine:

- Do the data and analyses in the docket demonstrate that the proposed MACT option reflects the maximum achievable reductions from coal-fired steam generating electric utility units?

- Is the mercury cap-and-trade option, as proposed, sufficient to ensure public health protection?

- What process did EPA follow in developing the proposed rule, and was this process consistent with applicable statutes, regulations, policy, guidance, and past Agency practice?

Background

Mercury is released globally into the environment through natural processes, such as volcanoes, and also from human activity. Man-made releases of mercury are primarily due to the burning of mercury-containing fuels and wastes, and through industrial manufacturing processes. Man-made mercury emissions from the United States are estimated to account for roughly 3 percent of total global mercury emissions. Mercury from lead smelters, municipal waste combustors, hospital waste incinerators, manufacturing operations, and other sources are largely already regulated by EPA. In the United States, the largest source of airborne mercury emissions is the coal-burning electric utilities industry, representing an estimated 40 percent of total U.S. man-made airborne mercury

emissions. EPA has estimated that one-third of all U.S. emissions of mercury are deposited within the contiguous United States, while the remaining two-thirds enter the global cycle. The January 2004 proposal is the first attempt to regulate mercury emissions from these utilities at the Federal level.

Airborne concentrations of mercury are generally considered to be small and not a serious health concern while still in the air. However, once mercury enters fresh-water and salt-water bodies, either directly or through air deposition, it can bioaccumulate in fish and other animal tissues in its more toxic form, methylmercury. As mercury bioaccumulates in the food chain, its concentration becomes increasingly higher in animals at the top of the food chain (such as larger predatory fish) that consume smaller contaminated organisms. Because of the bioaccumulation of methylmercury, the primary route of human exposure to mercury is through the consumption of fish, both salt water and fresh water. Excessive human exposure to mercury has been associated with severe detrimental neurological and developmental health effects. Depending on the dose, human health effects from exposure to mercury can include subtle losses of sensory and cognitive ability, tremors, inability to walk, and death. The developing fetus may be particularly sensitive to the detrimental effects of methylmercury; thus, exposure to mercury by women of child-bearing age is of particular concern.

From a global perspective, mercury accumulation in salt-water fish is a public health concern. EPA and the Food and Drug Administration have cautioned that young children, as well as women who might become pregnant, are pregnant, or are nursing should limit their consumption of certain salt-water predatory fish. Mercury bioaccumulation in U.S. water bodies is also a public health concern, and 45 States issued fish advisories for mercury in 2003. Many of these fish advisories caution that women and young children should limit their consumption of certain types of fish.

EPA Reference Dose for Methylmercury

Based on studies showing adverse health effects from exposure to methylmercury, EPA set a reference dose for methylmercury that was designed to protect the most sensitive subgroup (i.e., developing fetuses). An EPA reference dose reflects the estimate of daily exposure to the human population, including sensitive subgroups, that is not likely to cause harmful effects during a lifetime. The current EPA reference dose for methylmercury – which was included in EPA's 1997 Mercury Study Report to Congress – is 0.1 micrograms per kilogram of body weight per day.

Subsequent to EPA's 1997 Mercury Study Report to Congress, Congress directed[1] EPA to request the National Academy of Sciences to perform an independent study on the toxicological effects of methylmercury and to prepare recommendations on the establishment of a scientifically appropriate exposure reference dose. The National Academy of Sciences completed its review in 2000, and concluded that the EPA reference dose of 0.1 micrograms per kilogram was a scientifically justifiable level for the protection of health.

The most recent results from Centers for Disease Control and Prevention's ongoing National Health and Nutrition Examination Survey show that mercury blood levels of most children and women of childbearing age were below levels of concern corresponding to the EPA reference dose. However, 5.66 percent of childbearing-aged woman had blood mercury levels at or above the reference dose. The survey also questions participants about their fish consumption. For the 1999-2000 survey period, tuna and shrimp were the two most frequently cited types of fish/shellfish consumed. These results, and other studies, suggest that seafood (as opposed to fresh-water fish) is the predominant source of mercury exposure in the United States. However, some subpopulations in the United States consume more fish, including fresh-water fish, than the general population. These groups may be at increased risk from mercury exposure. For example, studies have shown elevated blood levels of mercury in some Native American tribes that consumed fresh-water fish.

Statutory Requirements for Controlling Mercury Emissions from Utility Plants

The Clean Air Act (CAA) requires EPA to regulate emissions of 188 air toxics (also known as known as hazardous air pollutants), including mercury. EPA was to identify and establish emission standards for major source categories emitting these pollutants. Specifically, section 112(d) of the CAA requires EPA to establish emission limits for major source categories emitting air toxics, commonly referred to as MACT standards. The MACT standard is to require the maximum degree of reductions achievable for the source category, taking into consideration cost and any non-air quality health and environmental impacts.

A key requirement of section 112(d) is that emission standards for existing sources in a category or subcategory shall not be less stringent than the average emission limitation achieved by the best performing 12 percent of the existing sources for which the Administrator has data. The emission limitation achieved by the best performing 12 percent of sources is referred to as the "MACT floor."

---

[1] H.R. Rep. No. 769, 105th Cong., 2d Sess. at 281-282 (1998). This is the Conference Report to accompany H.R. 4194, October 5, 1998.

The CAA also established specific requirements with respect to air toxics emissions from utilities. Section 112(n)(1)(A) requires EPA to perform a study of the hazards to public health that are reasonably anticipated to occur as a result of air toxics emissions from electric utility steam generating units. This study was to develop and describe alternative control strategies for emissions that may warrant regulation under section 112. Further, with respect to regulating emissions from utility plants, section 112(n)(1)(A) states:

> *The Administrator shall regulate electric utility steam generating units under this section, if the Administrator finds such regulation is appropriate and necessary after considering the results of the study required by this subparagraph.*

EPA published its Final Report[2] with respect to utilities in February 1998, but deferred making a determination as to whether regulation of these units was appropriate and necessary. However, the Final Report concluded that:

- Mercury from coal-fired utilities was the air pollutant of greatest potential concern to public health from utilities;
- Coal-fired utilities are estimated to emit about one-third (51 tons based on 1994 emissions) of U.S. anthropogenic (man-made) mercury emissions per year;
- Ingestion of contaminated fish is the most important route of exposure to mercury; and
- Modeling in conjunction with the available scientific data provides evidence for a plausible link between emissions of mercury from utilities and the methylmercury found in soil, water, air, and fish.

In its Final Report, EPA listed a number of research needs related to mercury emissions. These included obtaining additional data on mercury emissions, such as the amount emitted from various types of units; the proportion of divalent versus elemental mercury;[3] and how factors such as the control device, fuel type, and plant configuration affect emissions and speciation.

---

[2] Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units - - Final Report to Congress, EPA-453/R-98-004a, February 1998.

[3] Airborne divalent mercury is adsorbed onto particles or bound to other compounds and is deposited sooner and mainly in the vicinity of the emissions sources (local to regional distances), while elemental mercury (vapor) remains airborne longer and is transported on a hemispherical/global scale.

Information Collection Request

Based on the research needs outlined in the Final Report, the then-EPA Administrator concluded that obtaining additional information from owner/operators of coal-fired electric utility steam generating units was needed to determine whether regulation of electric utility steam generating units was appropriate and necessary. Accordingly, EPA used its authority under CAA section 114 to collect data from all domestic coal-fired electric utility steam generating units. The resulting information collection request (ICR) consisted of three phases of data collection:

- **Phase I** collected general information on every coal-fired electric generating utility unit and was completed in January 1999.

- **Phase II** consisted of obtaining information on the amount of coal received on a per shipment basis for the 1999 calendar year for every facility. In addition, the mercury and chlorine content of the coal was reported for every sixth shipment.

- **Phase III** consisted of emissions testing at 80 units,[4] which were selected to represent a cross-section of boiler and control device types. For each of the 80 units selected, testing for mercury was conducted at the inlet and outlet of the last pollution control device on the unit. Each unit was to conduct three separate test runs and to also sample and analyze the coal used during each of the three separate runs.

December 2000 Findings and Determination

In a December 20, 2000, Federal Register Notice, EPA published its finding that regulation of mercury emissions from coal-fired utility plants was appropriate and necessary. The notice described four primary sources of information for the finding:

- EPA's February 1998 "Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units -- Final Report to Congress."
- An ICR to all coal-fired electric utility steam generating units requesting coal data for 1999 and a request to certain units for stack test results to evaluate air toxics emissions.
- An evaluation of the mercury control performance of various emission control technologies currently in use to control other pollutants or that could be applied to such units to control mercury emissions.

---

[4] Emission tests were actually conducted at 79 different units with 2 tests conducted at 1 unit for a total of 80 tests.

- An evaluation of available health data related to mercury conducted by the National Academy of Sciences.

The Notice concluded that, ". . . during the regulatory development process, effective controls for mercury and other HAPs (hazardous air pollutants) can be shown to be feasible." The Notice recognized the considerable interest in using economic incentive programs, such as emission trading, to achieve emission reductions. However, in its December 2000 notice, EPA cited concerns about the potential local impact of emissions trading and noted that any trading program must be constructed in a way that assured communities nearest a source were adequately protected. The Notice stated:

> *Thus, in developing a standard for utilities, the EPA should consider the legal potential for, and the economic effects of, incorporating a trading regime under section 112 in a manner that protects the local populations.*

After issuance of these findings and its determination that regulation of utilities was appropriate and necessary, EPA began to develop a MACT standard for mercury emissions from coal-fired electric utility units. Additionally, a workgroup was established in August 2001 under the Clean Air Act Advisory Committee to provide EPA with input regarding Federal MACT regulations for coal-fired electric utility steam generating units. Appendix A provides a timeline of events associated with the development of the MACT rule.

Clear Skies Proposal

Concurrent with EPA's initial efforts to develop a MACT for utility units, legislation was proposed in Congress[5] to establish a multi-pollutant approach for addressing mercury, sulfur dioxide (SO_2), and nitrogen oxide (NOx) emissions from utilities. This legislation, referred to as Clear Skies, proposed a cap-and-trade approach to controlling emissions of these three pollutants. With respect to mercury, the initial Clear Skies legislation called for an interim cap on total U.S. mercury emissions of 26 tons per year by 2010. Based on modeling done in support of the Clear Skies Proposal, EPA estimated that some facilities would install mercury-specific technology by 2010 in order to meet the 26-ton cap. Clear Skies proposed a final cap of 15 tons on mercury emissions by 2018, and EPA analysis projected that additional sources would choose to install mercury-specific controls to meet the cap.

When Clear Skies legislation stalled in Congress, EPA decided to propose a cap-and-trade approach for controlling mercury emissions as an alternative to a

[5] Clear Skies was proposed in both the U.S. House of Representatives and Senate in July 2002, and reintroduced as the Clear Skies Act of 2003 on February 27, 2003.

MACT standard. EPA proposed these regulatory alternatives in the January 30, 2004, Federal Register Notice. In addition to the proposed mercury rule alternatives, EPA on January 30, 2004, also proposed new air rules for reducing SO_2 and NOx emissions. This proposed rule, now known as the Clean Air Interstate Rule (CAIR), would establish a cap-and-trade program for 29 States in the Eastern United States and the District of Columbia whose SO_2 and NOx emissions significantly contribute to fine particle and ozone pollution problems in other downwind States. Together, the CAIR and mercury proposals would create a multi-pollutant approach to controlling emissions from utilities similar to what was originally proposed in the Clear Skies legislation.

Proposed Mercury Rule

As a result of a prior court settlement[6], EPA had agreed to issue proposed power plant mercury emission standards by December 15, 2003. In the January 30, 2004, Federal Register Notice, EPA proposed its rule for regulating mercury emissions from coal-fired steam generating electric utility units. This proposal includes two different approaches for controlling mercury emissions from utilities: a MACT standard or a mercury cap-and-trade program.

EPA's Proposed MACT Standard Approach: EPA proposed separate emission limits to be achieved by 2008 for five subcategories: three subcategories for different coal types (bituminous, sub-bituminous, and lignite); one for coal refuse or waste; and one for a specific type of combustion process known as Integrated Gasification Combined Cycle (IGCC).[7] Table 1-1 shows the specific per unit emissions limits for existing units in the proposed rule.

Table 1-1: Proposed MACT Emission Limits

Subcategory	Emission limit (lbs/TBtu)*
Bituminous	2.0
Sub-bituminous	5.8
Lignite	9.2
Coal-Refuse	0.38
IGCC	19.0

* = pounds per Trillion British thermal units.

These emission limits were based on what EPA determined to be the MACT floor. EPA proposed that the MACT standard be based on the MACT floor as

[6] Under a settlement agreement reached in 1998 with the Natural Resources Defense Council, EPA agreed to issue a proposed rule for regulating mercury from power plants by December 15, 2003, and a final rule by December 2004. (*Natural Resources Defense Council v. EPA,*D.C. Cir., No. 92-1415, 4/15/98). Natural Resources Defense Council later agreed to extend the deadline for the final rule to March 15, 2005.

[7] The IGCC process converts coal into gas and uses the coal gas as fuel for generating electricity.

opposed to a beyond-the-floor[8] level because it concluded that technologies for reducing mercury emissions were not commercially available and, thus, beyond-the-floor emission standards were not achievable. EPA estimated that total national mercury emissions would be reduced from 48 to 34 tons per year if the proposed MACT rule was implemented.

EPA's Proposed Cap-and-Trade Approach. In lieu of adopting a MACT standard to regulate mercury emissions from utilities, EPA presented an alternative proposal that would regulate mercury emissions from utility units under a national cap-and-trade program implemented under section 111 of the CAA.[9] The cap-and-trade proposal included an unspecified interim cap on mercury emissions in 2010 and a final cap of 15 tons by 2018. Though EPA did not specify an interim cap level, the Agency proposed that it be based on the maximum amount of mercury reductions that could be achieved through implementing the controls necessary to reduce SO_2 and NOx emissions, i.e., the mercury co-benefit of these controls through implementation of CAIR. The preamble to the rule states that EPA modeling indicated an expected co-benefit level, which is the result of implementing the CAIR rule, resulting in mercury emissions of 34 tons per year. EPA also took comment on administering the cap-and-trade approach under CAA section 112 instead of section 111.[10] The primary difference between these two approaches is that a section 112 cap-and-trade program would be administered centrally by EPA while the section 111 program would be administered individually by States.

Scope and Methodology

We conducted our field work from May 2004 through December 2004, and did so in accordance with *Government Auditing Standards*, issued by the Comptroller General of the United States. We performed field work in EPA's Office of Air and Radiation locations in Washington, DC, and Research Triangle Park, North Carolina. We interviewed staff from EPA offices and outside organizations to gain an understanding of the rule as developed, other options considered, and the rule development process. We interviewed officials from EPA's Office of Air and Radiation; Office of Research and Development; Office of Enforcement and Compliance Assurance; and Office of Policy, Economics, and Innovation. We also contacted environmental and utility industry representatives, and State, local, and tribal organizations interested in the development of this proposed rule, to

[8] A MACT standard more stringent than the floor is referred to as "beyond-the-floor."

[9] Concurrent with this approach, EPA proposed to revise its December 2000 finding that regulating utilities under section 112 was necessary and appropriate.

[10] This approach would not require EPA to revise its December 2000 finding, but would require EPA to "de-list" utilities as a source category requiring a MACT standard.

obtain their views. We reviewed data and analyses developed in support of the rule, and public comments included in the rulemaking docket. We also reviewed related information provided by both EPA and non-EPA officials contacted.

The Government Accountability Office is conducting a review of technology-related issues for the proposed mercury rule, which is an important consideration in determining whether the MACT standard can be set a level that is more stringent than the floor. The Government Accountability Office report was not available in December 2004 for consideration in the OIG report.

Limitations

Our evaluation was conducted and completed before the Agency had completed the rulemaking process. Accordingly, our observations and characterizations about the process reflect the status of the rulemaking process at the time we completed our review. Issuance of the final rule is planned for March 15, 2005, and the final rule may consider additional information or analyses not available at the time we completed our review. For example, EPA released a notice of data availability for the proposed Clean Air Mercury Rule on December 1, 2004. The notice requests additional public comment on issues addressed in this report, and solicits further comment on new data and information to help EPA evaluate which regulatory approach will best reduce mercury emissions from power plants. We did not specifically consider the notice because it was released after we had completed our review and analyses. However, the notice includes information available previously in the public comment docket for this rule, and it is possible we had considered some of that information during our review.

The OIG was not provided with several important documents it requested from the Agency; therefore, that information was not available for consideration in this report. Our memorandum detailing the requested information, as well as specifics on what information was provided by the Agency, are provided in Appendix B. Consideration of the inter-agency review process was limited to information from EPA staff and information available in the docket only. We were not able to discuss the inter-agency review process with Office of Management and Budget (OMB) staff who were responsible for coordinating the inter-agency review process. The OIG did not independently analyze the databases or computer modeling programs that EPA used in developing the proposed rule. With respect to the development of the MACT standard, the OIG did not attempt to independently calculate the MACT floor.

Results in Brief

Evidence indicates that EPA senior management instructed EPA staff to develop a MACT standard for mercury that would result in national emissions of 34 tons annually, instead of basing the standard on what the top performing units were achieving in practice. Also, we determined that EPA's mercury cap-and-trade proposal – a nationwide emissions trading program for an air toxic – can be strengthened to better ensure that human health is protected and anticipated emission reductions achieved, should this approach to reducing mercury emissions be adopted. Further, although EPA rulemaking procedures are not consistently applied, Agency staff told us that they would have expected greater adherence to the guidance for mercury rule development due to the significance of this particular regulatory action, but this did not happen.

We recommend that EPA re-analyze mercury emissions data collected, and conduct a revised cost-benefit analysis for the updated MACT that takes into account the impact of mercury co-benefits achieved through the proposed CAIR. We also recommend that the Agency strengthen its cap-and-trade proposal. Further, we recommend that the Agency conduct an integrated analysis with respect to whether emissions reductions under either of these proposals are the most child-protective, timely, and cost-effective.

The Agency disagreed with certain aspects of our draft report, and offered suggested changes or revisions. The Agency's response did not specifically address our recommendations. We made changes to the final report based on the Agency's comments, as appropriate. See Appendix E for the full text of the Agency's official comments to our draft report and our response to these comments.

Chapter 2
Mercury MACT Development Compromised

Evidence indicates that EPA senior management instructed EPA staff to develop a MACT standard for mercury that would result in national emissions of 34 tons annually, instead of basing the standard on an unbiased calculation of what the top performing units were achieving in practice. The CAA requires that a MACT standard should, at a minimum, be based on the emissions levels achieved by the top performing 12 percent of units, not a targeted national emissions result. The 34-tons-per-year target was based on the co-benefits expected to be achieved from implementation of NOx and SO_2 controls under the proposed CAIR. EPA noted that this target was based on extensive analysis and, in EPA's judgment, represented the lowest level of mercury emissions that it could reasonably expect the utility industry to achieve.

Because the results of the MACT standard were prescribed and prior estimates were lower than what was proposed, we believe it likely that the standard understates the average amount of mercury emissions reductions achieved by the top performing 12 percent of power units. Some Agency officials told us that, in their opinion, the true MACT floor would result in lower mercury emissions than the 34 tons estimated from current MACT floor limits. Therefore, if this proposed MACT standard was adopted, it would not achieve the maximum emission reductions achievable and the associated health benefits. Further, this MACT standard, as proposed, does not provide a reasonable basis for comparison in determining which of EPA's two proposed regulatory alternatives (i.e., the MACT standard or the mercury cap-and-trade program) provides the better cost-benefit.

Requirements for MACT Standards

In accordance with the CAA, EPA is to establish MACT standards that require the maximum emissions reductions the Agency believes are achievable for a major source category. At a minium, the MACT standard cannot be less stringent than the average emission reductions achieved by the top performing 12 percent of units in a category (e.g., all coal-burning utilities) or subcategory (e.g., utilities burning bituminous coal) for which the Administrator has data. EPA has wide latitude in the types of emissions data used to determine the MACT floor, including the discretion to select a reasonable method to estimate emissions achieved, and to address variability to account for the most adverse operating conditions reasonably foreseeable. If EPA decides to set a limit beyond the floor, it must consider the cost of achieving those reductions, any resulting non-air quality and environmental impacts, and energy requirements.

In accordance with a court settlement, EPA had agreed to publish its final mercury rule by December 15, 2004. This date was re-negotiated with the court petitioner and the final rule deadline was extended to March 15, 2005.

EPA's Process for Addressing Variability in Computation of Mercury MACT Floor

As provided under CAA section 112(d), EPA first determined whether a MACT standard should be developed for all coal-fired units or sub-categories. EPA analyzed the ICR data and identified the top performing units from all units for which emissions data were collected. Evaluation of the ICR data for the top performing units focused on coal type, plant processes, and control technology. EPA could not identify a common attribute that contributed to mercury emission reductions for all of the top performing units that would allow development of a single MACT emissions limit for all units. Additionally, it was determined that no units had installed mercury-specific control technology, although controls installed to reduce emissions of other pollutants also helped reduce mercury emissions. When no single common factor was identified, EPA evaluated the data further and determined that sub-categorization by coal type, which is also a driving factor in plant design, was warranted to establish the MACT. One additional sub-category was established for a particular plant type – Integrated Gasification Combined Cycle – because the plant burns gas from coal rather than any particular type of coal.

For each sub-category, EPA identified the top performing units based on emission tests collected during the ICR. However, EPA determined that these emission tests alone did not sufficiently estimate the effect of fuel variability over time on the emissions of the best performing units. To account for this variability, EPA used coal composition data (i.e., mercury and chlorine content) for coal shipments collected during the ICR to estimate emissions throughout the year for the top performing units in each subcategory. This increased the number of emission points available from which to calculate the MACT limits. [11]

The emission points for each of the top performing units were ranked and then EPA selected one of the highest emissions points (i.e., the 97.5 percentile) for each unit. According to EPA, this emission point reflects the best performance under the worst foreseeable operating conditions for the unit. EPA took the average of these selected emission points for each sub-category and adjusted this

[11] Prior court cases have upheld EPA's right to consider variability in developing MACT floors. For a discussion of the appropriateness of EPA's efforts to account for variability, see *Cement Kiln Recycling Coalition v. Envt'l Protection Agency*, 255 F.3d 855 (D.C.Cir. 2001), *examining, Sierra Club v. Envt'l Protection Agency,* 167 F.3d 658 (D.C.Cir.1999) and *National Lime Ass'n v. Envt'l Protection Agency*, 233 F.3d 625, 629 (D.C.Cir.2000) ("National Lime II").

average to further account for variability (i.e., the 97.5 percent upper confidence level of the average). This adjusted average was established as the MACT floor and the proposed standard for each subcategory.

Unlike many previous MACT standards, the proposed utility MACT standard would not require the installation of a specific control technology since no mercury-specific control technology had been installed in utilities. EPA determined that emerging mercury-specific technologies were not yet commercially available for the utility industry. The Government Accountability Office is conducting a study to assess the current state of mercury control technology.

EPA Staff Instructed to Develop MACT Floor That Would Result in National Emissions of 34 Tons

Evidence indicates that EPA staff were instructed to develop a MACT standard that would result in national emissions of 34 tons per year. Some staff told us that they heard these specific directions and others told us that they heard in different meetings during rule development that the application of the MACT floor to utilities should equal 34 tons per year (a 29-percent reduction from the present 48-tons emitted nationwide). These statements were further corroborated by internal EPA e-mails, which specifically identified 34 tons per year as the number desired despite the fact that prior modeling results did not result in 34 tons. E-mails between EPA staff discussed various MACT emission limits by subcategory and modeling scenarios that could be used to get closer to the 34 tons target. For example, a November 2003 e-mail stated that:

> *If the 14+K of subbit ACI is using the 90% option and we restrict this to 60%, perhaps we can get in the 34 tpy range. I don't think that restriction would be considered inappropriate for a 2007 MACT analysis.*

EPA documents and an analysis of the process used to compute the MACT floor support EPA staff's statements that the MACT floor computations were developed to produce the desired national emissions of 34 tons per year. Documentation that we reviewed indicated that EPA conducted at least three Integrated Planning Model (IPM)[12] runs in order to reach the pre-determined target for national mercury emissions of 34 tons. The initial IPM run to try to reach the 34-tons target yielded a national emission of 29 tons (i.e., the IPM model indicated that mercury could be reduced from 48 tons to 29 tons). After changing the proposed MACT emission limits, a second IPM model yielded a

[12] EPA uses ICF Resources Incorporated's Integrated Planning Model for air emission modeling. The model projects what decisions utilities would make for meeting air emission regulations based on economic considerations.

national emission of 27 tons. While we were provided summary information about these two IPM model runs, they were not included in the EPA rulemaking docket.

An Agency source indicated that these results were not acceptable to senior management because they were not close enough to the 34-tons target. A third run performed, based on the proposed emission limits, showed 31 tons. EPA cited the 31-tons model results in the proposed rule, but explained in the preamble that 34 tons is the more probable emissions level because the model used to estimate emissions was underestimating the amount of mercury emissions that would occur. EPA noted that the IPM model may have understated mercury emissions by 2.3 tons for units burning bituminous coal.[13] Table 2-1 depicts the emission limits used in the three IPM runs and the resulting total national emissions:

Table 2-1: Results of Proposed MACT Scenarios to Reach 34 Tons

Coal type	Run #1	Run #2	Run #3 (Proposal)
Bituminous	0.57 *	1.4 *	1.9679 *
Sub-bituminous	6.46 *	5.06 *	5.8 *
Lignite	18.45 *	19.48 *	9.2 *
Total National Mercury Emissions (tons-per-year)	29-30 **	27.2-27.9**	30-31**

* Proposed per unit mercury emission standard expressed in pounds per trillion British thermal units (lb/TBtu).

** Estimated tons of national mercury emission resulting from modeling the application of the unit emission standard to all utility units.

The emission limits shown in Run #3 above, ultimately proposed as the MACT standard, were based on a multi-variability analysis submitted by WEST Associates (a western utility consortium).[14] However, EPA adjusted this approach, increasing the MACT floor emission limits for two of the three subcategories beyond those derived by WEST Associates. For example, WEST Associates used an upper confidence level of 95 percent of the mean of the best performing units to account for variability. EPA adjusted the confidence level to

[13] The IPM model only allows Activated Carbon Injection technology, a mercury specific control technology, to reduce mercury emissions at 60% and 90% levels. The inability of the model to address the full range of reductions between these two levels means that the model may have understated mercury emissions by as much as 2.3 tons for bituminous-fired units.

[14] The analysis was submitted during the last Federal Advisory Committee Act meeting, convened in April 2002.

97.5 percent, which resulted in an increase in the emission limit for two of the three sub-categories. According to EPA's variability analysis, this adjustment was made to account for EPA's interpretation of the number of units that should be included in the MACT floor analysis.[15] These adjustments increased the MACT floor closer to a national emission level of 34 tons per year.

Relationship of the 34-Ton Estimate to Cap-and-Trade Proposals

The 34-tons-per-year target is important because it is based on mercury emission modeling results used in two separately proposed cap-and-trade programs for utilities – CAIR and the mercury cap-and-trade program – proposed as alternatives to the mercury MACT. EPA has stated its intent to implement its multi-pollutant (mercury, SO_2, and NOx) cap-and-trade programs, originally included in stalled Clear Skies legislation, through the proposed CAIR and mercury regulations..

EPA has also proposed that the mercury reductions gained from implementing CAIR should serve as the interim cap on mercury emissions in the mercury cap-and-trade program. According to the preamble to the mercury rule, the reason for basing the interim cap on the co-benefits from CAIR is that the Agency does not believe mercury control technology that has been demonstrated for all coal types is commercially available. In addition, Agency officials stated that the 34-tons-per-year target was based on the co-benefits expected to be achieved from implementation of NOx and SO_2 controls under the proposed CAIR. They noted that this target was based on extensive analysis and, in EPA's judgment, represents the lowest level of mercury emissions that they could reasonably expect this industry to achieve by 2010.

Additional Estimates of Mercury Emissions

Interviews with sources both inside and outside the Agency suggest that if unbiased analyses of data were conducted, a range of possible MACT floor levels would most likely result. One EPA official stated that the true range of possible MACT floors was probably as low as 8 to 10 tons per year up to the mid-20s, but that either end of that range would be a stretch. Further, the source stated that the real range is about 15 tons per year to the low 20s for this MACT, and that anything above or below those numbers was a stretch. This includes the 34 tons proposed by the Agency. These statements about the possible range of MACT floors are supported by results of different MACT floor limits and/or varying model assumptions used by some organizations providing comments to the

[15] For example, West Associates used 5 units for each sub-category, while EPA used 4 units for the bituminous and sub-bituminous sub-categories and 5 units for lignite sub-category.

proposed rule. For example, the Clean Air Task Force evaluated the ICR data to develop MACT floor limits that were different than those developed by EPA. Applying these limits to the same IPM model used by EPA resulted in national mercury emissions of 12 tons[16] (i.e., a 75-percent reduction from 48 tons). Modeling by the Electric Power Research Institute and Edison Electric Institute used the MACT floor limits proposed in the rule and showed an estimated 32 tons of mercury emissions nationwide (i.e., a 33-percent reduction from 48 tons). Examples of varying modeling efforts and results can be found in Appendix C.

Conclusions

EPA's current estimate of the amount of mercury emissions occurring after implementing SO_2 and NOx controls, called for in EPA's CAIR, is 34 tons. Given (1) that EPA is attempting to implement the Clear Skies multi-pollutant approach through regulation; (2) the numerous modeling runs conducted to determine national emission resulting from different MACT emission limits; (3) the adjustments made in the accounting for variability; (4) the statements of EPA officials involved in the rulemaking process; and (5) EPA e-mails reviewed, we believe EPA's approach for developing the MACT floor was compromised. Further, it is unlikely that an unbiased calculation of the MACT floor would produce emission limits that would result in estimated national mercury emissions of 34 tons per year (i.e., EPA's current estimate of the co-benefit of SO_2 and NOx proposed regulations).

Recommendations

We recommend that the Assistant Administrator for Air and Radiation:

2-1 Conduct an unbiased analysis of the mercury emissions data to establish a MACT floor in accordance with the requirements of CAA section 112(d).

2-2 Re-negotiate with the court petitioner for an extension of the final rulemaking deadline sufficient to solicit and accept public comments on the unbiased analysis of mercury emissions data in an open, public, and transparent manner.

Agency Comments and OIG Evaluation

The Agency commented that the draft report incorrectly characterized the calculation of the MACT standard, and that the Agency had calculated the MACT

[16] The Clean Air Task Force considered the effect of implementing the proposed CAIR rule on the mercury MACT. EPA did not consider the impact of implementing CAIR in its MACT modeling efforts. More information on this issue is found in Chapter 4 of this report.

floor in accordance with the requirements of CAA section 112(d). The Agency also maintained that its extensive work, including development of the proposed Clear Skies legislation, showed that, in the absence of immediately available mercury control technology, the mercury reductions as co-benefits of SO_2 and NOx controls represent the lowest level of mercury emissions that the Agency reasonably expects could be achieved. We believe our report accurately characterized the MACT development process. Our observations were based on review of supporting documentation related to MACT development, and interviews with Agency staff and stakeholders involved in the process, including State and local, environmental, and industry groups. Although the MACT floor was ostensibly based on data from the top performing 12 percent of units, this data was analyzed with a final target already in mind, i.e., 34 tons. While the Agency has conducted analysis to determine the co-benefit of SO_2 and NOx controls, we do not believe this meets the requirements of CAA section 112(d) in developing the MACT standard. The Agency's complete response to the draft report and our evaluation of its response are in Appendix E.

Chapter 3
Cap-and-Trade Option Can Be Strengthened

EPA's mercury cap-and-trade proposal – a nationwide emissions trading program for an air toxic – can be strengthened to better ensure that human health is protected and that anticipated emission reductions are achieved, should this approach to reducing mercury emissions be adopted. The cap-and-trade proposal could be strengthened by:

- Adequately addressing the potential for hot spots.
- Establishing an interim cap that would provide greater incentive for utilities to install mercury-specific control technology by 2010.
- Setting a reasonable safety valve provision.
- Clarifying conditions pertaining to exemptions for small emitting facilities.

These changes could help ensure that the proposed mercury cap-and-trade program obtains the desired emissions reductions in a timely manner.

EPA's Proposed Cap-and-Trade Approach

A cap-and-trade program could provide several benefits in terms of controlling emissions. Trading programs generally provide regulated units with more flexibility to meet overall emissions reductions than do conventional command-and-control approaches because a unit may apply whichever control method it finds to be most appropriate and cost-effective to meet emission limits. This flexibility serves to minimize overall control costs in the market. Furthermore, cap-and-trade programs can provide greater environmental certainty by establishing fixed national emissions caps that cannot be exceeded. However, a cap-and-trade program's environmental benefits will depend on the adequacy of the cap.

Under EPA's proposed mercury emissions trading program, units that cannot cost-effectively reduce emissions through controls may buy allowances from units that were able to reduce emissions beyond their established allowance limits and are willing to sell their extra allowances. Each unit is required to possess one emissions allowance per each ounce of mercury it emits. Units would be allowed to buy and sell credits among one another in a national emissions market. EPA's proposed cap-and-trade alternative proposes that the interim mercury emissions cap for 2010 be based on the amount of mercury reductions achieved solely as a co-benefit through implementation of SO_2 and NOx controls under the proposed CAIR. As noted in Chapter 2, EPA's latest estimate of the mercury benefit from implementing CAIR is 34 tons per year. The cap-and-trade proposal sets a final cap of 15 tons per year in 2018.

Proposed Cap-and Trade Program Needs to Further Address Certain Issues

The proposed cap-and-trade rule for mercury meets the three basic guiding principles of trading programs as defined by EPA: a cap on emissions, accountability, and simplicity of design and implementation. However, we identified four issues with EPA's mercury cap-and-trade proposal that need to be further addressed. Details follow on each issue.

Interim Cap Could Be Tightened to Force Earlier Development of Mercury-Specific Control Technology

Although EPA has not yet set a specific interim cap for 2010, the preamble to the proposed rule states that the interim cap will be based solely on the mercury emissions reductions achieved as co-benefits of regulating SO_2 and NOx under CAIR, estimated by EPA to be 34 tons. Thus, it would not be necessary for units to install mercury-specific controls in order to meet the 2010 interim cap, and this would limit the effectiveness of the regulation to force new technological advances in mercury control. If the interim cap under this proposal is set at 34 tons, utilities could delay consideration of installing new mercury-specific technology until meeting the more stringent cap in 2018 is imminent. However, according to EPA officials, if the banking provision of the cap-and-trade program operates as intended, some facilities would have the incentive to implement mercury-specific controls before 2018, which would reduce emissions beyond the interim cap level before the final cap becomes effective. EPA officials also pointed out that experience under other cap-and-trade programs has shown that the largest emitters are typically the first to reduce emissions and will generally achieve the greatest level of reductions. According to the preamble, the reason for basing the interim cap solely on the co-benefits from CAIR is that EPA does not believe mercury control technology that has been demonstrated for all coal types is commercially available.

Further, the proposed rule does not address what would happen under the cap-and-trade approach if CAIR is not implemented. Given that the 2010 cap is based solely on the co-benefits from CAIR, it is unclear what would occur under the proposed rule if CAIR is not implemented.

An EPA official stated that although some EPA staff indicated they would like to see analyses on different cap levels for comparison purposes, no such formal analyses were conducted. EPA conducted one IPM run based on an interim cap of 34 tons and a final cap of 15 tons (in conjunction with CAIR), but no runs were conducted using alternative caps for comparison. Clear Skies analyses were made available in the proposed mercury rule docket, and according to an EPA official the mercury cap-and-trade IPM run is comparable to the Clear Skies IPM runs. According to this EPA official, one such run of Clear Skies had a different interim

cap (26 tons) and this run, while not exactly matching the modeling conducted for the proposed mercury cap-and-trade program, provides an idea about the costs of an alternative mercury cap.

Potential for Hot Spots Not Fully Analyzed

EPA did not fully analyze the potential for hot spots (i.e., areas of elevated pollutant concentrations) to occur under its proposed cap-and-trade option. The potential for hot spot formation under the proposed cap-and-trade rule has generated a great deal of concern and debate among various stakeholders. Modeling and projecting the likelihood of hot spots under the proposed rule is made difficult by the relatively high degree of uncertainty involved with mercury transport and deposition patterns (i.e., when the airborne mercury is deposited onto the ground or into water bodies), particularly local or near-field deposition.

Further complicating efforts to use computer models to determine where mercury deposition will occur is the fact that three different chemical forms of mercury are emitted by utility units and each has varying deposition patterns. For example, oxidized and particulate mercury are more likely to deposit locally or regionally, while elemental mercury travels and is more global in nature. Although air emission-related hot spots are generally thought of in terms of high ambient air concentrations near a source, this is not the only consideration with mercury. The main health risk associated with mercury is not its ambient concentrations, but rather its deposition into water bodies and resulting bioaccumulation in fish. However, the connection between air emissions and levels of mercury ultimately found in fish tissue is not yet fully understood.

EPA's Clean Air Markets Division conducted a Proximity Analysis to determine "where, in relation to water bodies, emissions would occur" under the mercury emissions trading provision of the Clean Air Interstate Rule. However, as noted in the analysis, the issue of hot spots was not fully analyzed:

> *This examination of projected mercury emissions has significant limitations and does not constitute an analysis of "hotspots." Such an analysis of hotspots would, in part, necessitate detailed assessments of the atmospheric fate, transport, and deposition of mercury from power generating sources, and assessments of the potential population exposure to mercury contaminated fish in water bodies due to generating and other sources.*

Although EPA did not conduct the detailed assessment of hot spots described above, EPA stated in the preamble to the proposed rule that it does not expect hot spots to occur for several reasons, as follows:

- Modeling suggests that the largest emitters, which are more likely to produce local deposition, will be the first to implement control technology under a cap-and-trade approach and will reduce emissions by the largest amount.

- CAIR would result in implementation of control technologies for SO_2 and NOx that also provide the co-benefit of reducing emissions of the types of mercury (oxidized and particulate) that are likely to deposit locally.

- The Acid Rain program has not resulted in the formation of hot spots.

- States have "the ability to address local health-based concerns separate from the mercury cap-and-trade program requirements," and under the proposed State-administered program would "retain the power . . . to adopt stricter regulations to address local hot spots or other problems."

- The proposed final cap would be a 70-percent reduction in mercury emissions from current uncontrolled levels (from 48 to 15 tons).

However, potential problems arise with EPA's reasoning. For example, the Acid Rain program controls for SO_2 emissions, which are primarily deposited regionally and globally, not locally, while mercury can deposit locally as well as regionally and globally. Trading programs are generally thought to be most effective for pollutants that do not deposit locally. Further, the Acid Rain program co-exists with the National Ambient Air Quality Standards program, which has established a minimum level of air quality for SO_2, while no such minimum standards exist as a back-stop in the mercury cap-and-trade proposal. In addition, the Acid Rain program contains a provision stipulating that, in the case of delayed implementation due to litigation, a more conventional command-and-control approach would take effect, but the proposed cap-and-trade rule for mercury lacks a similar provision.

While the preamble to the proposed rule notes that individual States have the authority under section 111 to adopt stricter regulations than those set by EPA, it does not address whether States would have this same authority under a section 112 cap-and-trade program. Further, approximately one-third of States have laws limiting "the ability of their regulatory agencies to adopt regulations that are more stringent than any federal environmental regulation." Thus, these States may not be able to adequately address hot spots, should they arise.

EPA has recognized that additional information is needed to better understand and address potential hot spots. For example, in the preamble to the proposed rule, EPA states its intent to reassess the hot spot issue by taking a ". . . hard look at the Hg emissions inventory after full implementation of the first phase cap. . . ," and also requested comments on how it might address hot spots in a cap-and-trade program. In addition, EPA suggested the use of trading ratios between regions as

a way to address potential regional deposition differences. The Agency also requested site-specific data on areas where commenters believe hot spots would continue to exist if a cap-and-trade program were implemented.

Due to time constraints, the OIG did not fully evaluate potential environmental justice implications resulting from a cap-and-trade program, nor did we fully assess the extent of the Agency's analysis of these issues.

Safety Valve Provision May Not Encourage Reductions

The proposed safety valve price may be set too low to achieve the intended effect of reducing mercury emissions through the installation of control technology and the open-market trading of emission allowances. The safety valve provision in the proposed cap-and-trade mercury rule provides a price cap on the cost of emissions reductions, and was included in the proposed rule due to uncertainties associated with future costs and the availability of mercury control technologies. Under the safety valve provisions of the proposed rule, if the price of allowances reaches a certain level, units will be permitted to borrow allowances from the future for a fixed price. To help ensure that the overall cap on emissions is met over the long-term, units can borrow only from their own bank of future allowances. The provision is intended to "minimize unanticipated market volatility" and ensure that "the cost of control does not exceed a certain level." Thus, in effect, units may emit more in the current period, but would be forced to emit less in the future because they are using future allowances. However, we identified two concerns with the proposed safety valve provisions.

Safety Valve Price. For a safety valve provision to be used appropriately (that is, only when market volatility makes it necessary), the price should be set so that it is higher than the market price of allowances or the actual cost of abatement (emission reduction). If this price is too low, it may be cheaper for the unit operator to purchase future emissions allowance at the safety valve price rather than installing emission controls. Under the proposed rule, the safety valve price is set at $35,000 per pound, or $2,187.50 per ounce, adjusted annually for inflation. This figure was decided upon during development of the Clear Skies Initiative, but new analyses have estimated that the actual cost of abatement will be substantially higher than $35,000 per pound.

Although EPA stated in one of the rule's supporting documents that, "based on current technological capabilities, the cost of mercury removal is expected to reach the safety valve price ($35,000/lb) by 2010," it further stated that "technological improvements could decrease the cost of mercury control over time and cause prices to remain below safety valve levels." Staff within EPA indicated that the current safety valve price of $35,000 was too low based on new analyses. For example, 2003 and 2004 Department of Energy estimates show the "baseline costs" of mercury removal to be $50,000 - $75,000 per pound, with cost

reductions expected over time. However, senior EPA officials told us that they did not believe the safety valve price would be reached because they expect the cost of activated carbon injection, a mercury-specific control technology, to decrease over time. According to these officials, the IPM does not account for this variable and may be misleading since it shows the cost of activated carbon injection remaining constant over time.

Safety Valve Borrowing. The proposed rule stated that units may purchase safety valve allowances from "following years," and the supplemental notice stated they may be purchased from allowances available for allocation in the next control period. The supplemental notice also provided an example of how a State could incorporate the safety valve provision into its cap-and-trade program. However, the proposed safety valve provision does not place a limit on the number of allowances a unit can borrow under this provision. As the Clean Air Task Force writes in its comments, a unit could, theoretically, continue borrowing indefinitely from future years by buying safety valve allowances in lieu of installing controls or buying allowances on the open market. Such an approach would make economic sense as long as the proposed safety valve price was set lower than the baseline cost of controls. In the proposed rule, EPA acknowledges that its "proposed approach may create implementation problems associated with the need to 'reconcile' at some point in time the allowances borrowed from future compliance periods," and requests comment on the issue.

Small Emitters Exemption Needs To Be Clarified

EPA has proposed that utility units emitting less than 25 pounds of mercury per year be exempt from the cap-and-trade program, but has not completely addressed how their exemption and the national emission cap will be impacted if their emissions increase. EPA included this exemption because of concerns that new mercury-specific control technologies expected to be developed may not practicably apply to these units. Based on EPA data developed for units operational in 1999, 396 of the 1,120 units operational in 1999 were estimated to have emitted less than 25 pounds of mercury per year each. These 396 units made up 35.4 percent of the total operating units, but contributed only 3,742 of the 95,975 pounds of estimated mercury emissions, or 3.9 percent in 1999. According to the proposed rule's preamble, EPA states there is reason to believe that the 15-tons Phase II cap can be achieved in a cost effective manner, even if the lowest emitting 396 units are excluded from coverage under this cap. EPA is soliciting comment on this proposal.

One commenter noted that both capacity utilization and emission rate increases could occur in small emitting sources after they have been exempted from cap-and-trade requirements. EPA does not address this issue in the proposed rule. Another commenter stated that EPA had done no analysis of the small emitter exemption with respect to either costs or impacts. According to this commenter, a

vast majority of the units emitting less than 25 pounds of mercury are part of a multi-boiler facility, and it is entirely likely that at some facilities all of the boilers are tied into common duct work for pollution control. Consequently, these units should be considered as one unit emitting over 25 pounds and not eligible for the exemption.

While we did not fully assess the impact of this, we believe the commenters have raised valid concerns. Further, we noted that the relative significance of these small emitters increases as the cap-and-trade program progresses. For example, in 2018, these emitters, based on their 1999 emissions, would represent 12.5 percent of the total 15 tons in emissions allowed under the final cap. If EPA moves forward with its cap-and-trade proposal, the Agency can better ensure that anticipated emission reductions are achieved if it clearly addresses the circumstances under which small emitters would have to participate in the cap-and-trade program.

Proposed Emissions Trading Rule Should Also Address Tribal Concerns

Although Executive Order 13175 requires EPA to develop an "accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications,"[17] tribal concerns were not addressed during development of the proposed cap-and-trade rule. In the preamble, EPA states that the proposed rule may have tribal implications because two coal-fired utility units are located in Indian Country. Representatives from the National Tribal Environmental Council (NTEC) informed us that neither they nor their approximately 180 member tribes had any involvement in the development of the proposed mercury rule. This was confirmed by an EPA official at a March 2004 public meeting on the proposed mercury rule.

Among NTEC's greatest concerns over the proposed mercury rule are:

- the absence of tribal involvement and/or consultation in the development of the proposal;
- a failure to adequately monitor mercury deposition on tribal lands, which means that the impact of mercury is unknown; and
- lack of consideration for American Indians and Alaska Natives' dependence upon fish and the terrestrial animals that feed on those local fish.

The average tribal member and child eats much more fish than the typical consumer and the representatives explained that tribes (especially children and the expanding youth population) are faced with increased adverse health effects

[17] Consultation and Coordination with Indian Tribal Governments (65 FR 67249, November 6, 2000).

caused by such exposure.

NTEC does not support the cap-and-trade program and noted that, if the program is implemented, there is no mechanism currently in place for the tribes to enter into cap-and-trade allowance sales. In fact, allowances are only available to the States. NTEC cited the U.S. Government's trust responsibility, which includes looking after the health and survival of tribes. This responsibility is met in part by conducting tribal consultation on a government-to-government basis.

EPA officials noted that other organizations, including States, were not consulted during the development of the cap-and-trade proposal. Although States were not consulted, we noted that States were allotted mercury allowances while the Tribes were not.

Conclusions

The cap-and-trade proposal can be strengthened to better ensure that the anticipated emission reductions are achieved, should this approach be adopted by EPA. First, the interim cap suggested under the current proposal is set at a level that could be met without installing mercury-specific control technology, thus potentially delaying installation of mercury-specific controls until 2018. Also, the cap-and-trade option has not adequately addressed the potential for hot spots. In addition, EPA needs to ensure that it establishes a safety valve provision that will have the intended effect of encouraging unit operators to install controls or buy emission credits. Further, EPA needs to ensure adequate tribal involvement for the proposed mercury rule to ensure that tribes are not negatively impacted by a cap-and-trade rule.

Recommendations

We recommend that the Assistant Administrator for Air and Radiation:

3-1 Re-assess the basis for the interim and final caps. This analysis should consider the results of the re-assessed MACT floor (see Recommendation 2-1).

3-2 Further assess the risk of hot spots and, if CAA section 112 residual risk requirements are not implemented, then section 111 cap-and-trade regulations should specifically identify how EPA will meet its intention to reassess the hot spots issue.

3-3 Strengthen the safety valve provision so that the safety valve price is set at a level whereby it is only used for its intended purpose of minimizing unanticipated market volatility. Alternatively, EPA may stipulate other

controls over borrowing from future allowances, such as imposing a greater than 1:1 allowance trading ratio; and allowances borrowed from the future will be reconciled to ensure that facilities cannot borrow indefinitely into the future.

3-4 Reassess the necessity of a small emitter exemption, and if a decision is made to exempt, explain in sufficient detail the reasoning for such a provision and establish how small emitters will be handled within the cap-and-trade program should they exceed emissions of 25 pounds a year.

3-5 Address tribal issues by: developing a mercury emissions consultation strategy with tribes, with the assistance of tribal representatives, that will ensure the Agency fulfills its trust responsibility and conducts proper government-to-government consultation with tribes; and establishing a mechanism for coal-fired utilities located on tribal lands to participate in the cap-and-trade approach.

Agency Comments and OIG Evaluation

The Agency's comments expressed a concern that the report does not "comprehensively and accurately describe" how the proposed cap-and-trade approach would work. The Agency also expressed concern that we did not highlight the knowledge EPA has gained from modeling and past experience with cap-and-trade programs. We believe our draft report portrayed an accurate representation of how the proposed mercury cap-and-trade program would work. One of the objectives of our review was to evaluate whether the proposed cap and trade rule was sufficiently protective of public health. As a result, we highlighted certain concerns with the rule as proposed. We made revisions, where appropriate, based on technical comments made by Agency staff and officials. However, there are several important differences between the Acid Rain program, to which the Agency often refers when discussing past cap-and-trade experience, and the proposed mercury cap-and-trade program. The Agency's complete response to the draft report and our evaluation of its response are in Appendix E.

Chapter 4
Rule Development Process Not Consistent with Expected and Past Practices

Although EPA rulemaking procedures are not always applied consistently, many Agency staff told us that they would have expected greater adherence to the guidance for mercury rule development due to the significance of this particular regulatory action, but this did not happen. When the Clear Skies legislation stalled, EPA decided to address the Clear Skies program in a regulatory manner instead. This led to EPA including a mercury cap-and-trade option, similar to Clear Skies, in its proposed mercury rule. As focus on the cap-and-trade approach increased, EPA began to de-emphasize the mercury MACT development process. This included:

- Cancelling the next scheduled Federal Advisory Committee Act (FACA) meeting and ending communication with FACA members.
- Abridging the normal intra-agency review process, particularly at the staff level.
- Failing to fully address the cost-benefit of MACT alternatives and not analyzing the potential impact of implementing CAIR on the proposed MACT option.
- Not fully analyzing the impact of the proposed mercury cap-and-trade program on children's health.

Description of Rulemaking Process

EPA's Action Development Process: Guidance for EPA staff on Developing Quality Actions outlines steps EPA staff and management are to follow when developing Agency actions, such as rules, policy statements, and statutorily mandated reports to Congress. The guidance suggests that EPA staff follow a prescribed set of steps beginning with tiering the action based on several of its characteristics. Once tiered, a standard process exists for developing the proposed action. As a Tier One action, the proposed mercury utility rule was considered a top action that would ". . . demand the ongoing involvement of the Administrator's office and extensive cross-Agency involvement on the part of the AAs/RAs (Assistant Administrators and Regional Administrators)."

The Action Development Process guidance contains five key elements, which are summarized below. These include steps for:

- planning sound scientific and economic analysis;

- developing and selecting regulatory options based on relevant scientific, economic, and policy analyses;
- involving affected Headquarters and Regional managers early and continuing involvement until the final action is completed;
- ensuring active and appropriate cross-Agency participation; and
- encouraging appropriate and meaningful consultation with stakeholders through substantive consultative procedures.

Appendix D describes the rule development process in detail.

Some FACA Members Considered Job Unfinished

Within EPA, the creation of an advisory committee is not required for MACT rule developments, but such groups have been formed to advise the Agency in past MACT rulemakings and can provide a means of substantive consultation with stakeholders. An EPA official noted that for contentious rulemakings where a great deal of stakeholder involvement and public comment is anticipated, such as the mercury rule, it is not uncommon for an advisory committee to be formed. FACA allows for the creation of committees, boards, commissions, councils, and similar groups to furnish expert advice, ideas, and diverse opinions to officers and agencies in the executive branch of the Federal Government. The Act notes that the function of committees is advisory only, and decisions on how the advice will be used is determined by the official, agency, or officer involved.

The FACA working group for this rulemaking, known as the Utility MACT working group, was formed within the Permits/New Source Review Air Toxics Subcommittee of the larger Clean Air Act Advisory Committee. Working group members consisted of representatives from State and local agencies; environmental organizations; industry; control equipment vendors; and coal interests, producers, and unions. Both co-chairs of the group indicated that they believed the working group had balanced stakeholder representation.[18] The working group was formed for an initial period of 1 year and met approximately once per month starting August 2001.

The working group was charged with providing input for the development of a MACT standard for utilities. In a presentation given to the group by the EPA co-chair, the group was instructed that they were not to reconsider the Agency's prior finding that regulation of coal-fired electric steam generating units under section 112 of the CAA was necessary and appropriate, nor were they to consider a cap-and-trade option. Although a cap-and-trade option was introduced in Congress in July 2002 in the Clear Skies legislation, this option was not considered by the working group.

[18] Although the working group did not include tribal representation, EPA solicited their participation.

In October 2002, the working group issued its final report, *Recommendations for the Utility Air Toxics MACT: Final Working Group Report,* in which it identified issues that "EPA must consider and resolve in its drafting of the utility MACT." Some of the issues identified included:

- sub-categories;
- floor levels;
- beyond-the-floor levels of mercury;
- compliance method (monitoring); and
- compliance time.

The working group decided early that consensus among its various stakeholder groups was unlikely, and did not attempt to reach agreement on specific recommendations it could make to the Agency. Instead, the report presented the opinions of all the stakeholders on the issues.

Though the working group issued the final report in October 2002, it held another meeting on March 4, 2003, just after Clear Skies legislation was re-proposed in February. Certain members of the working group had requested that EPA conduct additional analyses using the IPM to further explore the cost-benefit of different MACT proposals as presented by the working group members. Members of the working group did not have direct access to the IPM, as EPA contracts for its use through a third party, and thus requested that EPA have the additional analyses run and then provide the group with the results. According to several members of the working group we contacted, it was expected that the working group would receive the results of the additionally requested IPM runs at the March 4 meeting, but were instead told the runs were not yet complete. Another meeting was scheduled for April 15, 2003, to provide the results of the IPM runs, but members were notified by EPA of its cancellation via e-mail on April 1.

In July 2003, Administrator Whitman responded to Congressman Waxman's request for the status of IPM runs for the working group. The Administrator stated that it was the Agency's intention to convene an additional FACA meeting when the IPM analyses were complete. However, in March 2004, the Assistant Administrator for Air and Radiation said the Agency would not provide the additional MACT IPM analyses and would instead focus resources on developing a cap-and-trade alternative, the administration's preferred regulatory approach.

The working group has not met since its last meeting in March 2003 and has not been officially contacted by the Agency since its planned April 15, 2003, meeting was cancelled. A formal notice of termination has not been issued to the working group and, according to some members, they were not given an explanation as to why the working group ended. EPA has stated on its web site that it began proceeding with a cap-and-trade regulatory approach in the absence of Congressional action on Clear Skies legislation. The FACA working group's

deliberations were stopped after Clear Skies was re-proposed and before EPA began developing its proposed cap-and-trade regulation. While some working group members indicated satisfaction with the work completed by the group, others considered the job unfinished due to the lack of opportunity to consider the additionally requested runs.

According to senior EPA officials, the working group's original charter was for only one year. One of the officials acknowledged that EPA had initially intended to conduct the runs requested by the working group but later decided that it would not be beneficial. These officials further indicated that since the working group had not reached consensus, the Agency did not believe the working group should have been extended.

Intra-Agency Review Limited

According to staff involved, the intra-agency work group review process followed in this rulemaking varied significantly from past Agency practice and applicable guidance for Tier One rules in that the group only met two times and was not given an opportunity to provide meaningful feedback on the proposed rule. According to the Agency's regulatory development guidance, a work group is to meet frequently enough to ensure that all significant issues and options are discussed and agreed upon. Then, the significant issues and several options to resolve each issue are to be provided to senior management. Senior management then selects those options they believe will best achieve the goals of the action for a Final Agency Review.

The work group's first meeting was held on February 27, 2003, and the second and final meeting took place on August 7, 2004. In preparation for the first meeting, the work group chair e-mailed to the work group members a copy of the Utility MACT FACA working group's final report, along with a draft analytical blueprint for the rulemaking. According to EPA's Action Development Plan, an analytical blueprint is "a document that spells out a work group's plans for data collection and analyses that will support development of a specific action," and is intended to be developed as "a collaborative effort." The draft blueprint stated, "the intent of the rule is to require that oil-and-coal-fired units achieve a MACT-level of control," and it listed the "minimum analytical needs" for the rulemaking:

- A regulatory impact analysis, assessing the economic impact on industry of levels beyond the MACT floor.
- Assessment of multi-pathway concerns.
- A regulatory flexibility analysis addressing small business concerns.
- Assessment of environmental justice concerns.
- Children's health concerns.
- Unfunded mandate assessment, evaluating the impact of the rulemaking on State/local/tribal governments, some of which own or operate coal-fired units.

- ICR issues.

Although the above issues were identified for study in the draft analytical blueprint, some were never fully addressed, such as the children's health study and an assessment of environmental justice concerns. The draft blueprint also stated that:

> *". . . the EPA believes that emissions trading is prohibited under Section 112 of the CAA. However, industry, and to a more limited extent, some other stakeholders would like to explore emissions trading as an option (perhaps in beyond-the-floor analyses) for this rulemaking."*

Members of the work group, including the Office of Research and Development and the Office of Policy, Economics, and Innovation, submitted comments to the draft analytical blueprint via e-mail to the work group chair. But work group participants we interviewed stated that they received no feedback or modified drafts of any work products based on their comments and input.

In preparation for the second intra-agency workgroup meeting, members were asked to review and comment on four sections (approximately 42 pages) of an early version of the draft (July 3, 2003) preamble. However, intra-agency workgroup members received no modified work products that incorporated their feedback. Additionally, no Final Agency Review meeting was held for the proposed mercury rule whereby core intra-agency review participants had the opportunity to concur or nonconcur with the proposed rule before it was sent to OMB for review and final action.

Several EPA staff who were involved in the abbreviated intra-agency work group review process told the OIG that it was made clear to them by their managers, and in the case of one work group representative, by the work group chair, that decisions about this rule were being made at a "higher level." For example, in an e-mail discussing intra-agency comments, a member of the work group was told:

> *The decision was made at a much higher level than mine to "bypass" the normal EPA Work Group procedure prior to the proposal and we have been told that all the Office directors were contacted about both the process change and rulemaking.*

Similarly, these officials told us that it became clear to members that their feedback would not likely be considered. One Agency source said that, in general, there was not a meaningful opportunity for EPA offices to comment on this rule. Some Agency officials said they considered the intra-agency review process to have been conducted, but at a higher staff level and with less input than usual from lower staff levels. However, at least one office usually involved in the intra-agency review process – the Office of Enforcement and Compliance

Assurance – was neither given the opportunity to review nor submit comments regarding the proposed rule before it was sent to OMB, according to former and current Office of Enforcement and Compliance Assurance officials contacted.

According to senior EPA officials it is not unusual during the development of high-profile rules, particularly those under a tight deadline, for EPA to not strictly follow the Agency's prescribed rulemaking process.

Requirements for Cost-Benefit Analyses Not Fully Implemented

Although EPA conducted certain required analyses, other analyses were not completed. For rulemakings with an annual economic impact of $100 million or more, Executive Order 12866[19] requires that Federal agencies, in deciding whether or how to regulate, assess all costs and benefits of available regulatory alternatives and provide the reasoning for selecting the proposed regulatory action over such alternatives. This Executive Order also directs that Federal agencies base their decisions on the best reasonably obtainable scientific, technical, and economic information concerning the need for, and consequences of, the intended regulation.

EPA staff told OIG that senior management instructed them not to undertake certain scientific and technical analyses that they thought necessary. For example, staff were instructed during meetings not to conduct IPM runs (which could have been helpful in considering alternatives) until they were told the national mercury emissions per year desired for the MACT. As discussed in Chapter 2, EPA conducted analyses of various MACT floor levels, but presented only a 34-tons-per-year option to the public. In addition, the Agency did not fully analyze a beyond-the-floor MACT alternative.

EPA's cost-benefit analysis of the MACT proposal did not take into account mercury emissions reductions that would be gained as co-benefits resulting from NOx and SO_2 controls installed under the proposed CAIR. However, the Agency's cost-benefit analysis of the cap-and-trade option did consider CAIR co-benefits. This prevents a balanced comparison of the two options. EPA staff told us that a MACT-plus-CAIR alternative was not analyzed because, when the MACT floor was completed, CAIR had not yet been proposed. However, EPA issued a December 2004 Notice of Data Availability for the proposed rule, which included an analysis submitted by the Clean Air Task Force that estimates the impact (in terms of emission reductions) of CAIR in conjunction with the proposed MACT standard. The notice did not include a similar analysis by EPA.

The Agency did not monetize the health benefits of mercury reductions, though

[19] Regulatory Planning and Review, 58 FR 51735, October 4, 1993.

Office of Air and Radiation staff have said the final rule will include quantitative, non-monetized endpoints as well as a qualitative discussion. EPA staff told us that they have ongoing efforts to develop a benefits analysis, but that it is slow moving and has not been completed. Since March 2004, when the Administrator stated the Agency would take a closer look at the issue, there has been a process to try and do a full benefits analysis, but the process is moving slowly. While a benefits analysis should be based on scientific literature, staff told us that there had been pressure to base the analysis on public comment through the Notice of Data Availability. The notice presents a methodology for determining the benefit of mercury reductions and requests comment on this methodology.

Required Children's Health Analysis Not Comprehensive

EPA did not adequately evaluate the environmental health effects of the proposed rule on children. Executive Order 13045[20] requires such an evaluation because "[a] growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks." In prior MACT rulemakings EPA had determined that Executive Order 13045 and, therefore, a children's health evaluation, is not applicable because MACTs are technology standards and apply consistently to covered sources. However, since the proposed rule includes a cap-and-trade option, which is a performance standard that could result in an uneven distribution of emissions, it is covered under Executive Order 13045 and, therefore, an analysis of the rule's impact on children's health is required.

Although the proposed rule states that EPA evaluated health and safety effects pertaining to children, our review of the proposal and docket did not show that EPA performed such analyses in accordance with Executive Order 13045. We requested such analyses from EPA, but were not provided with any specific studies of the rule's impact on children's health. Interviews with officials from EPA's Office of Children's Health Protection indicated they were not involved during the rule development. However, Office of Children's Health Protection staff said their lack of involvement in such functions is not unusual due to limited staffing.[21] Members of the Children's Health Protection Advisory Committee (CHPAC) told us that the proposed rule does not adequately take into account children's vulnerabilities. The CHPAC outlined their concerns in a January 26, 2004 letter to the Administrator, in which they made several recommendations, including that the Agency "[e]valuate the possibility that hot spots could result"

---

[20] Protection of Children From Environmental Health Risks and Safety Risks, 62 FR 19885, April 23, 1997.

[21] A May 2004 OIG report found that there was no overall, coordinated strategy integrating children's environmental health efforts into the Agency as a whole (*The Effectiveness of the Office of Children's Health Protection Cannot Yet Be Determined Quantitatively*; OIG Report No. 2004-P-00016; May 17, 2004).

from the cap-and-trade program as proposed.[22] In a subsequent June 8, 2004 letter to the Administrator, CHPAC additionally recommended that EPA "[e]valuate the relative health benefits of reducing mercury exposure for children and women of child-bearing age under the MACT and cap-and-trade regulatory options."

EPA senior officials noted that prior studies on the health impact of mercury addressed the impact of methylmercury exposure on children and, therefore, the rule itself addresses children's health. We recognize that current reference dose levels for mercury exposure are based on the impact to children's health. However, we were not provided any analyses assessing the extent to which the proposed rule may result in uneven distribution of mercury deposition that could increase some children's exposure to mercury. Office of Research and Development officials noted that regardless of the extent of any additional analysis, they do not know what the impact of reducing sources emissions by a certain percentage would have on deposition or in what timeframe. However, they noted that reductions in emissions will reduce atmospheric mercury, which in turn will result in less deposition, lower mercury levels in fish, and ultimately reductions in human exposure to mercury. EPA officials stated that this type of extensive analysis had not been done for the proposed rule, but they hoped to have a more detailed assessment for the final rule. They further explained that the Notice of Data Availability issued in December 2004 proposed a process for quantifying the proposed rule's impact on mercury deposition and the resulting bioaccumulation in the environment.

Scope Limitation: Inter-Agency Review

Due to time constraints[23] and the fact that OMB controls this process and not EPA, the OIG did not evaluate the inter-agency review process and EPA's response to the edits resulting from that process. The inter-agency review process occurs under the direction of OMB after a proposed rule is submitted to the Office of Information and Regulatory Affairs in OMB for review, as stipulated in Executive Order 12866. The process is typically informal and, according to one EPA official, details on the meetings between OMB and other agencies, as well as comments submitted to OMB during the review, often are not included in the formal docket.

It is difficult to determine every agency involved in the editing process, which agency made specific edits to the proposal, or the timing of these edits based on inter-agency review documents contained in the docket. We identified comments from at least four agencies or offices other than EPA and OMB: the Department

[22] Chapter 3 of this report recommends that EPA further assess the risk of hot spots.

[23] Our field work in some areas was limited in order to provide the results of our review to EPA management in time for them to consider our recommendations in developing the final rule.

of Energy; the Department of the Interior; the Small Business Administration; and the Council on Environmental Quality.

Conclusions

The rulemaking process did not meet the expectations of some EPA staff and FACA work group members, and did not fully address certain Executive Order requirements to conduct cost-benefit and children's health analyses. These deviations from prior practice and Executive Order requirements appeared to have occurred, in part, because of the Agency's decision to include a proposed cap-and-trade option in the proposed rule, as well as a need to meet the deadlines for the proposed MACT rule reached in prior court settlements.

Recommendations

We recommend that the Assistant Administrator for Air and Radiation:

4-1 Ensure that the Office adheres to the Action Development Process during EPA's future rulemaking actions to include obtaining input from all relevant Agency Offices.

4-2 Conduct more in-depth cost-benefit analyses of the proposed mercury options to determine the preferred approach.

4-3 Conduct a more in-depth analysis of the impact of the proposed options on children's health.

Agency Comments and OIG Evaluation

The Agency stated that the draft report failed to recognize the nature of the regulatory development process and incorrectly stated that EPA did not adequately evaluate the proposed rule's impact on children's health. Further, the Agency stated that the draft report improperly characterized the process by suggesting that it had not been sufficiently inclusive. We believe the draft report accurately described the rulemaking process, and continue to believe that the Agency should have more comprehensively evaluated the proposed cap-and-trade rule's impact on children's health. A cap-and-trade program, while reducing overall emissions, can result in geographically uneven distributions of emissions. The proposed rule did not include an analysis of where or how likely such varying mercury emissions and resulting depositions could occur, and what impact this may have on children's health. The OIG does not agree that the Agency review process was inclusive. As we noted in our draft report, according to staff involved, the intra-agency work group review process followed in this rulemaking varied significantly from past Agency practice and applicable guidance for Tier

One rules. Given this rule's far-reaching national implications for human health, the environment, and the economy, the OIG believes it was important for the Agency to have been more inclusive of available Agency expertise and external stakeholder input to develop this rule. The Agency's complete response to the draft report and our evaluation of its response are in Appendix E.

Appendix A

Timeline of Events Related to Development of Mercury Rule

Date	Event
November 15, 1990	President signs CAA Amendments of 1990. Section 112 requires EPA studies of mercury and Hazardous Air Pollutant emissions from utilities.
December 1997	EPA issues "Mercury Study Report to Congress." Emissions trading discussed as a control option.
February 1998	EPA issues "Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units." Defers decision on whether regulation of utilities is necessary and appropriate under CAA section 112.
July 11, 2000	National Academy of Sciences releases report, "Toxicological Effects of Methylmercury," which concludes that EPA's reference dose for methylmercury is a scientifically defensible level. Estimates that 60,000 newborns a year could experience neurological damage due to mercury.
December 2000	EPA Issues Federal Register Notice making final determination that regulation of mercury from utilities under CAA section 112 is "appropriate and necessary." Discusses cap-and-trade as an option but states that such an approach must protect local populations close to a source.
August 1, 2001	First meeting of Utility MACT working group. Charge to the Group is to develop a MACT standard. Explicitly directed not to consider trading.
July 2002	Clear Skies Act of 2002 introduced in the Senate and House of Representatives. Proposed a multi-pollutant approach to controlling SO_2, NOx, and mercury emissions from power plants.
August 28, 2002	EPA contractor memo outlines options for developing proposed MACT floor.
October 2002	Utility MACT working group issues final report. Consensus not reached. Additional IPM runs recommended based on MACT emission limit proposals from stakeholder groups.
February 27, 2003	Initial meeting of intra-agency work group (one of two total meetings). Analytical blueprint prepared for group addresses traditional MACT, not cap-and-trade, and identifies minimum analyses needed.
February 27, 2003	Clear Skies re-introduced in House and Senate as Clear Skies Act of 2003.
March 4, 2003	WEST Associates issues white paper proposing multi-variability method for determining MACT floor; presented at last meeting of Utility MACT working group. Paper presented to FACA at its last meeting. Method eventually adopted by EPA but with some changes.
March 4, 2003	Last meeting of Utility MACT working group. April meeting canceled by EPA; group had planned to discuss results of recommended IPM runs.
March 14, 2003	Briefing provided to Administrator Whitman. Presentation states EPA will continue to develop a section 112 MACT standard unless Congress removes the requirement.

Date	Event
April 1, 2003	EPA cancelled last FACA working group meeting. E-mail indicates runs not yet available, and meeting would be rescheduled at a later date.
August 7, 2003	Second (and final) intra-agency work group meeting held, reviewing draft preambles. Several MACT emission limits proposed, none of which match those in published proposed rule.
November 4-5, 2003	E-mails between EPA officials discuss efforts to establish MACT floor resulting in mercury emissions of 34 tons per year, based on IPM runs using various proposed MACT emission limits.
November 26, 2003	EPA memo to file explaining MACT floor (based on WEST Associates method).
December 15, 2003	"Regulatory Flexibility Act Analysis" entered in Docket.
December 2003	EPA contractor issued memorandum discussing beyond-the-floor analysis.
December 15, 2003	Proposed mercury rule signed.
January 2004	EPA Report on Benefit Analysis entered in Docket.
January 28, 2004	"Energy and Economic Impact Analysis" entered in Docket.
January 30, 2004	Proposed mercury rule published in the Federal Register.
March 16, 2004	Supplemental Notice issued to the original proposed rule providing procedures for implementing cap-and-trade proposal.

Appendix B

OIG's Request for Documents Related to Development of Utility MACT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF INSPECTOR GENERAL
OFFICE OF PROGRAM EVALUATION
1301 CONSTITUTION AVENUE, N.W.(2460T)
EPA WEST BUILDING
WASHINGTON, DC 20004

November 15, 2004

MEMORANDUM

Subject: Document Request for Assignment Number 2004-1021 - Development of the Proposed MACT for Utility Units

To: Jeffrey Holmstead,
Assistant Administrator for Air and Radiation

From: Kwai Chan, /s/
Assistant Inspector General for Program Evaluation

This memorandum is a formal request to you and your staff cc'ed below for several documents that we need in order to complete our work on the subject evaluation. The majority of these documents have already been requested and are listed again herein. In addition, we are requesting specific information (see item 7 below) not previously requested that is needed for us to fully and comprehensively address our evaluation objectives. We request that you provide us with the following information by November 26, 2004, in order that this information can be fully considered in our review:

1. Any and all statistical analysis and related internal correspondence for the two MACT IPM runs conducted in November 2003, including electronic records, that are not included in the docket.
2. Any and all written OGC analysis concerning use of Section 111 vs. Section 112, both for the December 2000 findings and determination and the January 2004 proposed rule, including electronic records.
3. Any and all documentation showing final intra-agency concurrence (or equivalent)

for issuing the proposed rule, including electronic records.

4. Any and all written comments resulting from the intra-agency review process, including electronic records.
5. The analysis related to children's health that was specifically referred to in the proposed rule's preamble on page 4715 of the Federal Register Notice.
6. The Agency analysis determining the origination of Latham and Watkins language that was included in the proposed rule's preamble, and
7. Any and all internal and external Agency correspondence or other written communications related to the development of the MACT floor that were developed, transmitted, and/or received during the period October 15, 2003 through December 15, 2003, including e-mails meeting the definition of Federal Records.

We appreciate your prompt response to this request. Please contact Jim Hatfield, Assignment Manager, at 919-541-1030, or Carolyn Blair, Project Manager, at 919-541-7702, to coordinate the submittal of information related to this request. If any of the above information does not exist please indicate that fact in your response.

cc: Robert Brenner, Deputy Assistant Administrator for Air and Radiation
Bill Wehrum, Office of the AA for OAR
Jason Burnett, Office of the AA for OAR
Stephen Page, Director, OAQPS
Sally Shaver, Director, Emissions Standards Division, OAQPS
Bob Wayland, Combustion Group Leader, ESD, OAQPS
William Maxwell, Principal Rulemaking Contact, Proposed MACT for Utility Units, ESD,
Nikki Tinsley, Inspector General
Eileen McMahon, Assistant Inspector General for Congressional and Public Liaison
Mark Bialek, Counsel, OIG

Status of Agency's Response to OIG's Request for Documents Related to Development of Utility MACT

Item Requested	***Status***
1. Any and all statistical analysis and related internal correspondence for the two MACT IPM runs conducted in November 2003, including electronic records, that are not included in the docket.	1. We received limited information after the draft report was provided to the Agency for comment. Specifically, we were provided copies of Agency e-mails that discussed how the information used in these MACT IPM runs was developed.
2. Any and all written OGC analysis concerning use of Section 111 vs. Section 112, both for the December 2000 findings and determination and the January 2004 proposed rule, including electronic records.	2. Since this was a legal issue before the courts, we determined that we would not address this, so the information was not needed.
3. Any and all documentation showing final intra-agency concurrence (or equivalent) for issuing the proposed rule, including electronic records.	3. No documentation provided.
4. Any and all written comments resulting from the intra-agency review process, including electronic records.	4. No documentation provided.
5. The analysis related to children's health that was specifically referred to in the proposed rule's preamble on page 4715 of the Federal Register Notice.	5. Additional information in general was provided after the draft report was issued, but no analysis on children's health specific to this rule was included.
6. The Agency analysis determining the origination of Latham and Watkins language that was included in the proposed rule's preamble, and	6. The Agency pointed out the information in the docket related to this issue, but did not provide specific Agency analysis. Since this issue was related to inter-agency review process, which is controlled by OMB, we did not fully address this issue (See Scope Limitation in Chapter 4 of this report.)

7. Any and all internal and external Agency correspondence or other written communications related to the development of the MACT floor that were developed, transmitted, and/or received during the period October 15, 2003 through December 15, 2003, including e-mails meeting the definition of Federal Records.	7. No documentation or response received other than the limited information in the e-mails provided for Request 1 above.

Different MACT Floor Proposals

Source	Emission Limits (Input base - lbs/Tbtu)													
	Process Sub-Categories								Coal Type Sub-Categories					Total Estimated Emissions
	FBC	FBC (sub-Bit. + Bit)	FBC - Lignite	Other	Bit. - Hot	Bit. - Wet	Bit. - Saturated	IGCC	Sub-Bit. + Bit.	Bit.	Sub-Bit.	Lignite	Coal Refuse	
EPA Proposed Rule	NA	NA	NA	NA	NA	NA	NA	19.0	NA	2.000	5.800	9.200	0.4	34 [1]
FACA-Environmental	0.190	NA	NA	0.210 [2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9 [3]
FACA - Industry	2.000	NA	NA	NA	3.700	3.200	2.200	NA	NA	NA	4.200	6,500	NA	25-30 [3] 36 [6]
FACA - State & Local - Option 1	NA	NA	NA	NA	NA	NA	NA	NA	0.600	NA	NA	NA	NA	6.7 [3]
FACA - State & Local - Option 2	NA	NA	NA	NA	NA	NA	NA	NA	0.400	NA	NA	NA	NA	6.3 [3]
FACA - Clean Energy Group	NA	0.320	12.0	NA	NA	NA	NA	NA	1.223	NA	NA	9.091	NA	13.1 [3]
Clean Air Task Force [4]	NA	NA	NA	NA	NA	NA	NA	4.9	NA	0.420	1.500	4.500	0.1	12 [5]

Abbreviations

Bit.: Bituminous
FACA: Federal Advisory Committee Act
FBC: Fluidized Bed Combustion
lb/Tbtu: pounds per Trillion British thermal units
IGCC: Integrated Gasification Combined Cycle
MACT: Maximum Achievable Control Technology
NA: Not Applicable

Notes:

1 Estimate based on Integrated Planning Model results.
2 Applied to all units except FBC
3 Based on estimates developed by Northeast States for Coordinated Air Use Management.
4 Clean Air Task Force preferred a MACT with no sub-categorization but re-computed a MACT floor based on EPA's proposed subcategories.
5 Based on Integrated Planning Model run and includes co-benefit reductions from Clean Air Interstate Rule.
6 Based on calculations performed by the industry group.

Appendix D

EPA's Rule Development Process

EPA actions are assigned to one of three tiers based on the nature of the anticipated issues and the level of cross-Agency interactions needed to ensure a quality action. The proposed rule is a Tier one rule and meets the following criteria.

Tier 1 Criteria: Administrator's Priority Actions
This tier will include top actions that demand the ongoing involvement of the Administrator's office and extensive cross-Agency involvement on the part of the Assistant/Regional Administrators.

Factors to consider in making a judgment about placing an action in Tier 1 are:

- major cross Agency or cross-media policy implications or precedents
- potential for major or precedent-setting implementation issues
- potential for major cross-Agency, cross-media, or inter-agency controversy
- potential for major economic impact on other levels of government or the regulated community
- highly controversial in terms of external interest
- ongoing, formal involvement of the Agency's highest level of management (Administrator, Deputy Administrator) is necessary or desired
- presents a significant opportunity for the Agency to advance the Administrator's priorities

Action should be placed in Tier 1 if...

- science issue(s) are precedent setting and controversial
- economically significant per Executive Order 12866 (i.e., > $100 million), unless the program office can justify placement in Tier 2
- economics issue(s) are precedent setting and controversial

The program office develops the proposed rule, which may take months to years depending on the complexity of the rule, priorities, and court/statutory deadlines. Rule development follows five major stages, as outlined in the Agency's Action Development Plan. The first stage is determining the proper tier for the action based on the criteria outlined above. The following table describes the five stages of an Action Development Plan.

Five Major Stages of an Action Development Plan

Stage 1. Tiering the Action

- Understand tiering
- Place action in the appropriate tier
- Obtain tiering approval

Stage 2. Developing the Proposed Rule or Draft Action

- Charter the workgroup
- Get the workgroup underway
- Prepare the preliminary analytic blueprint and get early guidance from senior management
- Prepare the detailed analytic blueprint
- Senior management approval of analytic blueprint
- Complete data gathering, consultation, peer review, analyses, and options development
- Select Options
- Develop the proposed action by preparing preamble, rule, and supporting documents
- Conduct Final Agency Review to ensure senior management approval
- Office of Policy, Economics, and Innovation review for rules deemed as "significant" under Executive Order 12866

Stage 3. Requesting OMB Review for Proposed and Final Actions (if necessary)

- Determine if OMB review is necessary. Only those regulatory actions designated "significant" under Executive Order 12866, "Regulatory Planning and Review" are subject to review by OMB (e.g., actions having an annual effect on the economy of $100 million)
- Prepare regulatory action for submission to OMB
- Address OMB's comments
- Docket the OMB review process

Stage 4. Requesting the Administrator's Signature and Publishing an Action

- Request the Administrator's signature
- Publish the action in the Federal Register and open docket(s)

Stage 5. Developing the Final Action and Ensuring Congressional Review

- Receive public comments
- Consider and address public comments
- Determine next steps
- Submit actions to Congress under the Congressional Review Act or the Courtesy Copy Policy

Appendix E

Agency Comments to the Draft Report and OIG Evaluation

MEMORANDUM

SUBJECT: Comments on the December 17, 2004 Draft Evaluation Report Entitled, Additional Analyses of Mercury Emissions Needed Before EPA Finalizes Rules for Coal-Fired Electric Utilities

FROM: Jeffrey R. Holmstead
Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency

William H. Farland, PhD
Acting Deputy Assistant Administrator for Science
Office of Research and Development
U.S. Environmental Protection Agency

TO: Nikki Tinsley
Inspector General
U.S. Environmental Protection Agency

DATE: January 24, 2005

Thank you for giving us the opportunity to review the draft report referenced above and to open dialogue with OIG staff. We have substantial concerns with the referenced draft including several inaccuracies and flaws that we feel must be addressed before the report is finalized. This memorandum briefly summarizes our major concerns.

Agency scientists and experts know a great deal about mercury: what are the sources, both domestically and internationally; where does mercury in this country come from; what is the chemistry that converts mercury deposited on the land and in the water into mercury that becomes available to the food chain; what are the routes of exposure in this country to mercury; what are the potential impacts of controls on that exposure; and what is the status of the various technologies now being studied.

While some questions remain in our understanding of many of these linkages, this will not prevent the Agency from regulating mercury from power plants, and it will do so as effectively as possible, informed by the full body of knowledge it now possesses. The Agency also recognizes that mercury emissions from facilities as complex as coal-fired power plants should not be considered in isolation of the other efforts to reduce air pollution; hence the Administration's strategy to further control SO_2 and NOx while instituting new, specific regulations for mercury. The Agency believes that such a

a strategy can deliver significant overall health benefits to a broad segment of the American public.

EPA strongly urges the IG to take the broad base of information we know about mercury, as well as the outstanding unanswered questions, into consideration when developing the final report.

1. **The draft report criticizes the rulemaking process as being incomplete even before a final rule is issued.** This critique rings hollow given the iterative nature of rulemaking. The rulemaking process consists of a proposed rule, a public comment period and often additional information before final decisions are made. The IG characterized the process as incomplete before the process had finished. For example, a number of the issues regarding benefit-cost analysis raised in the draft report are issues that the Agency is working on as evidenced by its Notice of Data Availability on November 30, 2004.

> ***OIG Response:*** *Our review was initiated at the request of seven U.S. Senators, who asked that we complete this review in sufficient time to allow the Agency to address any issues raised in our report. We have added information to the Scope and Methodology section in Chapter 1 of the Final Report explaining that our review was completed while the Agency was still in the process of finalizing the rule. Accordingly, our report reflects findings and observations about the status of the process at the time we completed our review. We look forward to seeing the results of the Agency's additional cost-benefit analyses, as recommended in our report.*

2. **The draft report inaccurately suggests that US power plant mercury emissions represent a large part of the human exposure problem.** Most exposure to mercury comes from eating fish from the world's oceans and the mercury in these fish comes from a variety of sources released over many years, including natural emissions like volcanoes, and anthropogenic emissions from many countries, representing emissions from a variety of sectors, in addition to emissions from US power plants. It is because US power plants are part of the larger problem that EPA has proposed, for the first time ever, to require reductions from this sector.

Given the global nature of mercury exposure and the uncertainty in the time to realize benefits from current emission reductions, the action to reduce mercury emissions from power plants must be seen in the larger context of all the activities EPA and others in the international community are implementing to reduce exposure to mercury.

OIG Response: *Our draft report did not suggest that mercury emissions from U.S. power plants represent a large part of the human exposure problem. Power plants are one of many sources of mercury emissions. The primary objective of our review was to assess EPA's development of the proposed rule for regulating mercury emissions from coal-fired electric utility units, and we included information in our draft report on mercury emissions and mercury health effects for background purposes. Nonetheless, we have included additional information in Chapter 1 of the Final Report to put total U.S. mercury and U.S. power plant emissions in the context of global mercury emissions. We understand that primary route of human exposure to mercury is through the consumption of fish and that the Centers for Disease Control and Prevention surveys indicate that seafood is the predominant type of fish consumed by women of child-bearing age and children. However, certain subgroups, such as Native Americans, eat more fresh-water fish and may be more susceptible to mercury exposure than others. We added this information to the background section of our final report.*

3. **The draft report does not comprehensively and accurately describe how the proposed cap-and-trade system would work, leading the reader with misimpression about what our experience and modeling has taught us.** The draft report fails to recognize that a cap-and-trade system requires emissions reductions on a concrete timeline of declining caps, thus leading to continual reduction of emissions and promotion of new technologies. It also fails to acknowledge that, under this system, the largest emitters typically will be the first to reduce their mercury emissions and will generally achieve the greatest level of reductions.

The draft report criticizes the cap-and-trade proposal for not requiring the installation of mercury-specific controls until 2018, but this is inaccurate and reflects a misunderstanding about how cap-and-trade works. The report should recognize the fact that it is reductions in mercury emissions that will lead to improvements in public health and these reductions will occur much earlier than 2018. Moreover, neither the Maximum Achievable Control Technology (MACT) approach nor the cap-and-trade approach would require any particular technology for controlling mercury. Either approach would require power plants to meet certain standards for mercury control, and then let individual plants find the best way to meet those standards.

OIG Response: *One of the objectives of our review was to evaluate whether the proposed mercury cap-and-trade rule was sufficiently protective of public health. As a result, we highlighted certain concerns with the rule as proposed. As such, we limited our focus of the mercury cap-and-trade proposal to concerns about the interim cap level, the potential for hot spots formation, the safety valve provision, the exemption of small emitters, and tribal impacts.*

Our draft report portrayed an accurate representation of how the mercury cap-and-trade program works. While the proposed mercury cap-and-trade rule should ultimately result in emissions reductions, we do not agree that the proposal provides a "concrete timeline of declining caps." For example, the proposed rule provides an interim cap that is based on co-benefits from existing technologies and can be achieved without the implementation of mercury-specific controls. Since the interim cap for mercury emissions can be achieved without mercury-specific controls, the proposed rule may not adequately promote the use of new technologies. Also, the only other mercury cap is the 2018 final cap, and EPA modeling indicates it may not be met in 2018 due to the banking provisions of the proposed mercury trading program. Finally, our draft report noted that neither the proposed cap-and-trade nor the MACT option require the use of any specific technology.

While EPA has experience with cap-and-trade programs such as the Acid Rain program, there are differences in the transport and fate of SO2 and mercury emissions which need to be addressed in a cap-and-trade approach to controlling mercury emissions. For example, SO_2 emissions are primarily deposited regionally and globally, while mercury can deposit locally. Additional differences between these two cap-and-trade programs were highlighted in Chapter 3 of the draft report.

4. The draft report incorrectly characterizes the calculation of the MACT standard. The draft report did not independently calculate the MACT floor, but instead simply relied on assertions made by critics of the proposal as the basis for their critique. The proposed MACT floor was calculated in accordance with the requirements of CAA Section 112(d) by basing the standard on what the top performing 12 percent of units were achieving in practice, taking into account subcategorization and variability.

Contrary to the claims in the draft report, the Agency did investigate beyond-the-floor MACT alternatives and did propose a beyond-the-floor standard where technology was found to be available (i.e., Integrated Gasification Combined Cycle (IGCC) subcategory).

OIG Response: *The OIG did not inaccurately characterize the calculation of the MACT floor. Our analysis was based on discussion with a number of EPA stakeholders and EPA officials, and review of supporting documentation. We found evidence that although the MACT floor was ostensibly based on data from the top performing 12 percent of units, this data was analyzed with a final target already in mind, i.e., 34 tons. As stated in the Agency's Comment 5 to our draft report, this "floor" of 34 tons was obtained during the Clear Skies legislative process. Accordingly, we do not consider this floor to be based on an unbiased analysis of what the top performing 12 percent of units were achieving.*

With respect to IGCC units, our review focused primarily on the development of the standards for existing units. Of the over 400 coal-fired power plants in operation in the U.S., two are IGCC plants. Although EPA did not propose a beyond-the-floor standard for existing IGCC units, EPA proposed an emission limit for new IGCC units that was below the calculated floor for IGCC units and was based on EPA's determination that mercury reduction of 90 percent could be obtained for this subcategory through the use of carbon bed technology.

5. The draft report suggests that the proposed rule was flawed because other regulatory alternatives that would achieve emissions levels lower than about 34 tons per year were not developed or proposed. In particular, the draft report makes much of the fact that the MACT proposal was developed with the goal of achieving a nationwide emissions level from affected power plants of about 34 tons per year. The report fails to consider the fact that EPA had developed extensive information about mercury emissions and control techniques in the power sector during the MACT regulatory development process and during the development of the Clear Skies initiative. That work caused us to conclude that mercury reductions could, in fact, be achieved in the power sector over the 3-4 year MACT compliance period specified by the statute. However, these reductions would not come for the most part from mercury-specific controls (such as activated carbon injection). Extensive work conducted by the Office of Air and Radiation and the Office of Research and Development indicated that mercury-specific controls will not become readily available for commercial application to this industry until 2010 or later - well beyond the MACT compliance period. Consequently, the proposed rule is predicated on the assumption that virtually all mercury reductions during the MACT compliance period would have to be accomplished as a co-benefit of installing air pollution controls designed to remove SO_2 or NOx. As part of the Clear Skies effort, EPA had extensively studied the capacity of the power sector to install SO_2 and NOx controls during the period up to 2010. That work showed that 34 tons per year was the lowest level of mercury emissions that we could reasonably expect the power sector to achieve through the aggressive application of SO_2 and NOx controls up to 2010. Further, as a part of the FACA process established for this rulemaking, industry submitted what they thought would be possible under a true co-benefit approach (i.e., no mercury-specific controls). Their estimate was that 36 tons per year of mercury would be emitted under a MACT approach. The EPA proposal is grounded in careful analysis as to what levels of mercury control reasonably can be expected over the MACT compliance period.

OIG Response: *Our draft report concluded that the MACT development process was compromised for several reasons. This included the fact that several MACT floor proposals were lower than the EPA's proposed MACT rule, including several proposals developed by EPA in trying to achieve a floor that would result in annual emissions of 34 tons. This included two EPA IPM runs that showed national emissions of 29 tons and 27 tons, that were not included in the rulemaking docket or available for public comment. While the Agency has conducted analysis to determine the co-benefit of SO_2 and NOx controls, we do not believe this meets the requirements of CAA section 112(d) in developing the MACT standard. For example, the co-benefit is based on an average performance of all units, not just the best performers. We continue to believe the Agency should conduct additional analyses before finalizing the rule. As noted in the draft report, the Government Accountability Office is conducting a review of technology-related issues for the proposed mercury rule.*

6. The draft report fails to recognize the nature of the regulatory development process and incorrectly states that EPA "did not adequately evaluate the environmental health effects of the proposed rule on children." We have made it clear from the start of the rulemaking process that the health effects of greatest concern are possible developmental effects in fetuses and young children exposed to unsafe levels of methylmercury. Unlike most other rules that EPA develops, this rulemaking is singularly directed at developing an appropriate regulatory approach for addressing the potential impacts on children. Evidence of this can be seen in EPA's first guiding principle in the development of a final mercury rule which states that the rule will concentrate on the need to protect children and pregnant women from the health impacts of mercury.

Consistent with this principle, EPA Office of Air and Radiation participated in an ongoing dialogue with the Children's Health Protection Advisory Committee (CHPAC) and responded to CHPAC's recommendations on mercury exposure in children. Further, EPA and others have conducted extensive work on the health effects of mercury for the developing fetus and young children, including a National Academy of Sciences review completed in 2000. The Inspector General's draft report misses this key point.

OIG Response: *We do not believe we failed to recognize the nature of the rulemaking process. Further, the Agency should have more comprehensively evaluated the proposed cap-and-trade rule's impact on children's health. A cap-and-trade program, while reducing overall emissions, can result in geographically uneven distributions of emissions. The proposed rule did not include an analysis of where or how likely such varying mercury emissions and resulting depositions could occur, and what impact this may have on children's health.*

Children's Health Protection Advisory Committee members did not characterize their interaction with the Agency as an ongoing dialogue. Committee members told us that the Agency's response to their concerns with the proposed rule did not satisfactorily address their recommendations.

7. The draft report improperly characterizes the process by suggesting that it has not been sufficiently inclusive. EPA has held dozens of high-level inter-office and external meetings on this rule. This inclusive process was needed both because the rule has far-reaching national implications for human health, the environment, and the economy and also because a well-informed decision on an issue this complicated requires hearing diverse perspectives. While there is always room to improve communications within and with those outside of EPA, there is little basis to fault the Agency in this case.

OIG Response: *The OIG does not agree that the Agency review process was inclusive. As we noted in our draft report, according to staff involved, the intra-agency work group review process followed in this rulemaking varied significantly from past Agency practice and applicable guidance for Tier One rules. Specifically, the work group process followed in this rulemaking was unusual in its short duration, infrequent meetings, late start with respect to the final rule deadline, and overall lack of communication and feedback between the work group and Agency decision makers. Further, work group members were not given the opportunity to review and comment on an entire draft proposal before it was published in the Federal Register. For example, staff from the Office of Enforcement and Compliance Assurance were never given a draft of the proposed rule to review or comment on, thus this office could not assess the adequacy of the proposed rule's monitoring, record keeping, or reporting provisions as it typically does for Tier One MACTs. With respect to meeting with external stakeholders, tribal representatives told us that they were not consulted during the development of the proposed cap-and-trade option. Given this rule's far-reaching national implications for human health, the environment, and the economy, the OIG believes it was important for the Agency to have been more inclusive of available Agency expertise and external stakeholder input in developing this proposed rule.*

Again, thank you for the opportunity to review the draft report. We would be happy to work with you and your staff to ensure that you promptly receive all the information and analysis you need to finalize the report. The final report should include an improved discussion of (1) the global nature of mercury exposure and the uncertainty in the time to realize benefits from current emission reductions; (2) how a proposed cap-and-trade system would require emissions reductions on a concrete timeline; (3) the approaches to calculation of the MACT floor; (4) the substantial effort EPA devoted to evaluating the risk of mercury exposure on children; and (5) the inclusiveness of EPA's process towards reaching a final rule.

OIG Response: *The Agency's comments have been included in the final report as appropriate. We appreciate the efforts of both the Office of Air and Radiation and the Office of Research and Development in working with us to clarify certain technical issues and in providing prompt input so that we could issue our report in a timely manner.*

Appendix F

Distribution

Acting Administrator (1101A)

Assistant Administrator for Air and Radiation (6101A)

Deputy Assistant Administrator for Air and Radiation (6101A)

Acting Deputy Assistant Administrator for Science, Office of Research and Development (A101R)

Acting Deputy Assistant Administrator for Management, Office of Research and Development (A101R)

General Counsel, Office of General Counsel (4010A)

Agency Followup Official (the CFO) (2710A)

Agency Followup Coordinator (2724A)

Audit Followup Coordinator, Office of Air and Radiation (6102A)

Audit Followup Coordinator, Office of Research and Development (A102R)

Associate Administrator for Congressional and Intergovernmental Relations (1301A)

Associate Administrator for Public Affairs (1101A)

Director, Office of Air Quality Planning and Standards (C404-04)

Deputy Director, Office of Air Quality Planning and Standards (C404-04)

Audit Liaison, Office of Air Quality Planning and Standards (C404-2)

Inspector General (2410)