

National Air Audit System FY 1985 National Report

Control Programs Development Division

**U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711**

December 1985

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Publication No. EPA-450/2-85-009

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I. OVERVIEW OF AUDIT FINDINGS

The air quality management objectives of the Clean Air Act (CAA) are to attain the national ambient air quality standards (NAAQS) as expeditiously as practicable, maintain them thereafter, and prevent significant air quality deterioration. The CAA gives most of the responsibility for attaining these objectives to the States. Therefore, the overall goal of the National Air Audit System (NAAS) is to determine if State and local air pollution control programs are achieving the CAA's air quality management objectives. In spite of some minor shortcomings, the FY 1985 audit effort provided a good assessment of the health of the national air quality management program.

While it is clear that in FY 1985 the State and local air pollution control agencies get high marks in some areas, particularly when considering the difficulty and magnitude of the air quality management task and the limited resources and tools available to do the job, their overall score relative to actually meeting all the literal objectives of the CAA shows room for improvement. Some of the deficiencies are minor. In other cases, programs are under way at the State or national level to correct the deficiencies. There are, however, some deficiencies that if left unattended could threaten the overall health of some air quality management programs. In order to support this conclusion, it will be necessary to identify those activities that make up an air quality management program, specify how those activities are to be conducted as specified by Environmental Protection Agency (EPA) regulations and guidance or by recognized good practice, and then compare those activities and practices to what was found during the FY 1985 audit program.

Air Quality Data

The starting point for air quality management is ambient air quality data. Is the air quality good and, thus, in need of protection against significant deterioration by potential new sources or is it poor, dictating the need for additional control of existing sources and offsetting emission reductions for new sources? In order to make these determinations, it is necessary to have a sufficient quantity of high quality ambient air monitoring data available in a timely fashion. The FY 1985 audit showed that States have done a commendable job in establishing and operating ambient monitoring networks for criteria pollutants and that good quality data are generally available. The audit indicates that State and local agencies have continued their successful performance in operating and maintaining their State and local air monitoring stations (SLAMS) and national air monitoring stations (NAMS). No significant or widespread problems were discovered concerning network design or monitoring siting.

The audit showed that timeliness of data submittal remains a problem for many agencies, particularly for submission of lead (Pb) data which are late about 25 percent of the time. Another problem area in the data management section of the audit was a deficiency by 24 percent of the agencies in the submittal of the required annual SLAMS report. Corrective

actions are being taken to resolve these problems. This will be accomplished by early identification of late data or deficient annual SLAMS reports and prompt notification of the appropriate Regional Office for follow up.

The audit indicates that most of the State and local agencies are doing a good job of maintaining adequate and up-to-date quality assurance plans. The only significant problems with respect to the achievement of quality assurance goals are related to accuracy for nitrogen oxide (NO₂) and precision for Pb. The low values for NO₂ accuracy and Pb precision are believed to be related to the complexity of the NO₂ measurement method and the low ambient Pb levels.

The audit indicated that 82 percent of the audited agencies had a need for new or replacement of air monitoring or laboratory equipment. The total equipment needs were approximately \$4.6 million with \$3.6 million required for monitoring equipment and \$1 million for laboratory equipment. This finding indicates that data completeness and reliability problems will be encountered if this area receives no attention. Therefore, \$2.4 million has been included in FY 1986 105 grant funds to replace carbon monoxide (CO) and ozone (O₃) monitors and to procure size-selective particulate matter monitors. It is anticipated that similar funding levels will be made available in FY 1987.

Air Quality Evaluation

Once the availability of air quality data is established, it is only of value if it triggers an appropriate action via the air quality management process. After the data are collected, they must be evaluated to determine the appropriate control action. The FY 1985 audit showed that over 90 percent of the agencies published annual air quality reports and over 80 percent evaluated attainment and nonattainment area designations based on those data. The audit and a subsequent survey also showed that action has been initiated by the audited agencies on all relevant new violations of the NAAQS. Action, however, generally does not include redesignations under section 107 of the CAA from attainment to nonattainment. Thus, the viability of the section 107 designation program as a continuing and comprehensive planning tool is seriously in question.

Emission Inventory

In order to develop a control strategy, it is necessary to relate air quality to source emissions using such tools as an air quality model. A good emission inventory is an absolute prerequisite for such an analysis. The audit indicated that almost all agencies have inventories for major point sources, but only 55 percent of the agencies maintain an area source inventory. Point source inventories are relatively current--and agencies plan to keep them current via the new source and operating permit programs--but few agencies routinely modify their inventories to reflect sources' compliance with regulations. The audit suggests that area source inventories are not as comprehensive as they should be. Some categories are missing all together. Mobile source inventories seem to be almost neglected by many agencies that do not have direct responsibility for this inventory.

Furthermore, only two-fifths of the agencies indicate that they use the most current factors to update their mobile source emission inventory.

A number of State and local agencies have begun, or are beginning, to develop inventories of potentially toxic substances, but these are primarily for point sources and cover groups of sources and pollutants that differ greatly from agency to agency.

While many point source inventories appear adequate as a starting point for State implementation plan (SIP) modeling and development of control strategies, most area and mobile source inventories are receiving less attention in frequency of updates and periodic reevaluation. This lack of attention may create problems when dealing with urban ozone problems, where area source emissions of volatile organic compounds (VOC) may outnumber point source emissions. This lack of emphasis on area and mobile source emissions is indicative of a generic transition problem that air pollution control agencies seem to be experiencing. This problem is one of transition from a control program focused on the control of stack emissions from a few big sources with well understood control technology to a program of controlling many relatively small and poorly recognized sources with control technology that has not previously been widely used and to controlling nontraditional nonstack sources. Accordingly, because of the lesser quality of some mobile and area source inventories, "reasonable further progress" tracking is not as precise a tool for monitoring progress toward attainment of the NAAQS as EPA had originally intended.

Modeling

As noted previously, air quality models are used to relate emissions to ambient air quality and, hence, to determine the necessary control measures. The FY 1985 audit indicated that most agencies are knowledgeable and capable of performing and reviewing most routine modeling analyses. However, the State/local agencies generally do not follow EPA procedures in using nonguideline models. The agencies also appear to have problems in implementing EPA modeling guidance for sophisticated models, as approximately one-third of all modeling analyses submitted to EPA had to be returned for revisions. Modeling analyses for emission trades ("bubbles") fared worse than the average, with over four-fifths being returned to the States. It is interesting to note that modeling analyses (all types) performed by industry and submitted to the State/local agencies for concurrence had a similar revision rate of approximately one-third; bubble modeling had a higher return rate of two-thirds.

It is anticipated that the issuance of the revised EPA modeling guideline, and the increasing availability of updated modeling training courses, will ease the overall implementation problems currently affecting State/local agencies. The modeling efforts associated with bubble analyses appear incomplete, however. This indicates that more advance interaction is needed among sources, States, and EPA before any modeling provisions of a "generic" bubble rule can be made workable.

SIP Revisions

The CAA clearly envisions that control agencies would periodically evaluate source/receptor relationships, i.e., the relationship between air quality data and source emissions data, and revise their SIP control strategies and resultant emission regulations accordingly. If the State does not act in these situations, the CAA requires EPA to initiate State action by calling for revisions to the SIP. The FY 1985 audit found the following with respect to State and local development and implementation of their SIP's:

1. While the majority of agencies are making progress in submitting the required rules, 44 percent of the SIP revisions that were either newly due or overdue in 1984 had not been completed by the agencies and, of those completed, 27 percent had not been submitted to EPA.

2. Almost half of the additional studies that the agencies had committed to complete by the end of 1984 as part of their SIP control strategies had not been completed and 64 percent of these studies were behind schedule.

3. Agencies regularly consult with EPA concerning bubbles and other source-specific SIP revisions. However, the audit and a subsequent survey of EPA Regional Offices revealed problems with "generic" bubble rules (i.e., rules in which emission trades are granted by the States directly without the need for EPA approval). Information available revealed that some States operated generic bubble rules without prior EPA approval. This practice places sources that have received such bubbles in jeopardy of potential EPA action to enforce the EPA-approved SIP limit. Also, the limited information available indicated problems with many generic bubbles that had been issued.

4. While most agencies took action (SIP revisions, studies, monitoring, enforcement) when discrepancies were found between actual source activity (i.e., increases or decreases in growth) and past projections, many of the agencies performed these evaluations at intervals greater than 5 years.

It was clear from the audit that a lack of resources and technical capabilities contribute to some of the SIP problems just mentioned. It was also clear, however, that in some instances the problems were attributed to too low a priority being given to SIP development and tracking by some States. Upcoming efforts to develop and implement the new stack height regulations, a post-1987 O₃ policy, and a revised particulate matter standard should significantly stimulate the SIP development efforts in most States.

I/M Programs

The CAA required that SIP's for O₃ and CO nonattainment areas with attainment date extensions to 1987 provide for vehicle inspection and maintenance (I/M). The results of the 16 I/M program audits conducted in FY 1984 and FY 1985 indicate that a number of serious problems exist in

some I/M programs. These problems must be addressed if I/M programs are going to achieve the emission reduction targets committed to in the SIP's. Four of the six problem areas identified--enforcement problems, low failure rates, high waiver rates, and poor quality repairs--have a direct bearing on the emission reductions achieved by I/M programs. The other two problem areas--analyzer quality assurance and data analyses--have more indirect effects; however, they reflect to an extent the States' ability (or inability) to assess program performance and improve it when necessary.

Twelve of the 16 programs audited were identified as having critical or serious operating problems. Nine of these 12 are decentralized programs and the other three are government-run, centralized programs. The most chronic and the most challenging problem facing EPA is the issue of low failure rates, especially in decentralized programs.

The programs audited represent a good cross-section of the types and sizes of the 33 I/M programs currently operating nationwide. It is, therefore, reasonable to expect that many of the programs which have not yet been audited are experiencing many of these same problems. This position is supported by current operating data available from some of the other programs.

The audit results clearly identify the need for EPA to continue its efforts to work with each State or local I/M program to address problems identified in audits. In addition, EPA should give a high priority to conducting I/M audits in the remaining programs as soon as possible.

New Source Review

The CAA anticipates that the review of new sources by the States will be one of the main mechanisms by which they attain and maintain the NAAQS and prevent significant air quality deterioration. A State's new source review (NSR) program must be designed and implemented to prevent a new source from aggravating an existing air quality problem or creating a new problem where one does not already exist. The FY 1985 audit verified that State and local agencies are generally familiar with and have strong support for the preconstruction review process.

This year's audit findings support and oftentimes amplify the findings from the FY 1984 NSR audit. The findings indicate that most agencies perform their overall NSR program responsibilities reasonably well, although, in a number of State and local agencies, problems were identified with respect to the consistent and adequate application of certain specific program requirements. In addition, auditors occasionally mentioned that noticeable improvements had already been observed in the performance of some agencies where specific deficiencies had previously been found. This is certainly to the credit of these agencies in their efforts to improve in-house performance and to strive for a greater level of national consistency. Overall, however, EPA auditors often cited the lack of adequate file documentation as a hindrance to a complete evaluation of the agencies' permit review procedures. With respect to specific audit topics, EPA continued to find significant problems with the way that many agencies carried out their source applicability determination procedures, with the lack of thorough

ambient air quality impact analyses in some instances, and with the way that different methods were used to require operating limitations on new and modified sources. The audit once again noted the overall tendency of agencies to rely on New Source Performance Standards (NSPS) in defining best available control technology (BACT). The audit also confirmed the fact that agencies are typically willing to allow prevention of significant deterioration (PSD) applicants to use existing data in lieu of new monitoring data, but raised a new concern when EPA found that the basis for such actions was not always well documented or in complete conformance with existing EPA criteria for representative data.

Yet, despite the assortment of problems that the audit was able to identify, it is still fair to say that most State and local agencies function in a competent manner and generally have their own individual strong points. For example, some agencies routinely extend the requirement for BACT to non-PSD sources, or require BACT for all pollutants once it is determined to be required for any pollutant. The focus on permit files demonstrated that most agencies are usually more prone to internal inconsistencies than to routine malpractice. While not always true, auditors were usually able to find good examples along with the bad whenever selected permit files were examined. The EPA hopes that through the audit process many of these inconsistencies can be identified and then satisfactorily addressed by agencies within their existing technical and legal frameworks. Where appropriate, EPA will seek to provide the necessary guidance and training to support State and local agencies in their NSR efforts.

Compliance

The ultimate success of a State air quality management program relies on its ability and will to enforce its regulations. Many States and locals showed one or more strong points characteristic of a successful air compliance program, such as high source compliance rates supported by high inspection frequency rates, performance of all required NSPS source tests, expeditious resolution of violators, and few long-term violators. Other States had source files that were for the most part well organized, up-to-date, and complete, reflecting a reasonable profile of each source. These positive points show that most States are fulfilling compliance and enforcement responsibilities under the CAA.

Inspection rates for Class A1* SIP sources generally increased over those reported in last year's audit, although four States are still unacceptably low (inspection rates of less than 60 percent). Compliance rates for Class A1 SIP sources remained roughly the same as last year. The NSPS national average for both inspection and compliance rates rose, even though some individual State rates declined slightly. The NSPS inspection rates for two States are still seriously deficient, with figures of 33 percent. Overall, inspection rates for National Emissions Standards for Hazardous Air Pollutants (NESHAP) remained steady while compliance rates

* Class A1 includes sources with actual or potential controlled emissions greater than or equal to 100 tons per year.

fell slightly. Fourteen States still have NESHAP inspection rates at or below 55 percent. This information shows that performance did not change significantly from last year's audit. In the coming fiscal year, the States and locals will be working to further improve compliance of sources.

The audits also revealed that several State and local agencies, to a varying extent, still have weaknesses in three areas vital to a strong and effective compliance program. First, some source files maintained by State and local agencies do not contain verifiable information reflecting a reasonable profile of each source. However, there has been some improvement since last year's audits in the condition of States files, where the percentage of those reviewed that reflected a reasonable profile of the sources increased from 58 percent to 72 percent. Second, some inspection reports still are of poor quality (no mention of operating or emission parameters or pollutants emitted). For some agencies, there was a noticeable improvement in the quality of inspection reports since the last review, but there remain significant deficiencies in this area. Third, some of the reviewed agencies' enforcement efforts are not always effective in reducing the number of long-term violators by expeditiously returning documented violators to compliance, although there was a slight drop in the percentage of reports that indicated sources were not being expeditiously returned to compliance (from 30 percent down to 26 percent).

Thus, while there are improvements in all of these critical areas, some States and locals need to heighten efforts on the aforementioned three areas to further strengthen their compliance programs. Success in these three areas is vital to the establishment and maintenance of State and local credibility with EPA and the public.

Next Steps

The EPA Regional Offices are now in the process of working with the State and local agencies to correct those deficiencies that were identified in the FY 1985 audit. They will continue this effort into FY 1986. In addition, EPA intends to use the results of the FY 1985 audit in its program planning and budgeting cycle in order to assure that resources are directed to areas of highest need. After the FY 1984 audit, EPA convened a symposium to develop specific recommendations for future improvements to the air program based upon what was learned in the audit. The symposium included representatives from EPA and the State and local air pollution control agencies. A report on the implementation of these recommendations will be distributed by EPA early in 1986. A similar report is planned by EPA based upon the results of the FY 1985 audit.

II. INTRODUCTION

The NAAS was developed in 1983 through a joint effort of the State and Territorial Air Pollution Program Administrators (STAPPA), the Association of Local Air Pollution Control Officials (ALAPCO), and EPA. The NAAS provides uniform national criteria for evaluating (auditing) State and local air pollution control programs. Such nationally applicable criteria minimizes inconsistency of program audits carried out by EPA's ten Regional Offices.

The need for the NAAS evolved as State and local air pollution control agencies assumed responsibility under the Clean Air Act (CAA) for an increasing number of programs. The EPA responded to the concerns of the STAPPA and ALAPCO members by agreeing to participate in a STAPPA/ALAPCO/EPA workgroup. The workgroup set forth to develop and direct the implementation of an auditing system that would ensure the desired national consistency and would confirm that State and local air pollution control programs were operating in such a manner as to satisfy the national requirements of the CAA.

The workgroup decided that the primary goals of the NAAS should be to identify any obstacles that are preventing State and local agencies from implementing an effective air quality management program and to provide EPA with information which can be used to develop more effective and meaningful national programs. The NAAS should provide audit guidelines that EPA and State and local agencies can use (1) to meet statutory requirements; (2) to assist in developing an acceptable level of program quality; (3) to account for the achievements, shortcomings, and needs of various air programs; (4) to identify programs needing further technical support or other assistance; and (5) to manage available Federal, State, and local resources effectively so that the national ambient air quality standards (NAAQS) are attained and maintained as expeditiously as possible.

The first audit covered four program areas selected by the workgroup: air quality planning and SIP activity, new source review, compliance assurance, and air monitoring. Standardized audit guidelines for each program area were written by subcommittees appointed by the workgroup. The subcommittees were chaired by a State agency person with an EPA staff person serving as a coordinator. Local agencies and the EPA Regional Offices were also represented on each subcommittee. The workgroup also developed the protocol for implementing the audit guidelines.

These guidelines were used for conducting the first NAAS audits in FY 1984 (ending September 30, 1984). A national report (EPA-450/2-84-009) that summarized the results of the 68 audits performed the first year was issued in December 1984. The audit guidelines were revised for FY 1985 and vehicle inspection/maintenance was added as a fifth program audit area.

The guidelines were used by EPA Regional Offices in FY 1985 to audit 66 State and local air pollution control programs, including all States except California plus Puerto Rico, the Virgin Islands, and the District of Columbia. The California State agency was not audited because the local district agencies in California are responsible for implementing the various air quality management programs. The local agencies audited were:*

Allegheny County, PA
Asheville, NC
Fresno County, CA
Jacksonville, FL
Lane County, OR
Nashville, TN
Northwest APA, WA

Philadelphia, PA
South Coast AQMD, CA
Southwest APCA, WA
St. Louis, MO
Tampa, FL
Toledo, OH
Wayne County, MI

The STAPPA, ALAPCO, and EPA encouraged State/local personnel from one agency to serve as members of the audit team for another agency. Four States participated in this activity in FY 1985. The agencies that participated in the audit exchanges listed the following benefits of the program:

It provides an opportunity to compare their agencies' programs with the host State's program to see what improvements can be "transplanted."

It fosters communication with other agencies at the working level so that common problems can be shared.

It provides general insight into what other agencies are doing.

All of the participating agencies indicated that the exchanges were beneficial and that they would continue their participation in the future if resources allow. Such audit team exchanges apparently offer an excellent opportunity to learn firsthand how other States operate their programs.

The audit teams varied in size; the number of auditors in an agency at any one time rarely exceeded five. All five of the program areas were generally not audited at the same time. Also, all program areas were not audited in each agency because the five activities selected for audit were not performed by all agencies.

The EPA Headquarters personnel observed ten audits. This served to

*Additional local agencies were included in the air monitoring audits because of the delegated responsibility of operating local air monitoring networks.

provide national overview on the audits and was part of the quality assurance program to which STAPPA/ALAPCO and EPA had agreed.

The protocol followed by the Regional Office in conducting the audits included advance preparation prior to the on-site visit, an initial meeting with the agency director, discussions with agency staff, review of the agency files, and an exit interview.

The advance preparation involved, among other things, sending a letter to the agency well in advance of the audit to confirm the date and time and to identify the individuals performing the audit. The guidelines and questionnaires were also provided to the agencies with a request to complete portions of the questionnaire and to return them to the EPA Regional Offices at least 2 weeks before the scheduled visit.

The site visits were conducted generally in four phases:

- ° The audit team met with the agency director and key staff to discuss the audit goals and procedures to be followed.

- ° The auditors discussed the questionnaire with the personnel in charge of each of the five audited activities.

- ° The agency files were reviewed to verify the implementation and documentation of required activities.

- ° An exit interview was held to inform agency management of the preliminary results of the audit.

The Regional Offices drafted an audit report after each site visit and requested that each audited agency review it. The individual agency audit reports were used by EPA to compile and write this FY 1985 national report.

III. AIR QUALITY PLANNING AND SIP ACTIVITIES

EXECUTIVE SUMMARY

Four major program components within the air quality planning and SIP activities area were evaluated in the FY 1985 audit. These components were air quality evaluation, emission inventories, modeling, and SIP evaluation.

This section of the audit was again in the form of survey questions that were, for the most part, answered by the audited agencies. Generally, there was not an actual "audit" conducted in that file reviews were generally not used to confirm the answers given. A large part of this section does not lend itself as well to file checks as the other sections (new source review, air quality monitoring, vehicle inspection/maintenance, compliance assurance), but some parts might. Air quality evaluation, emission inventories, and modeling activities could be verified by selected file reviews. In the future, this section of the audit should probably have a least a minimum amount of file verification to be a meaningful part of the NAAS.

The FY 1985 audit revealed that the majority of the audited agencies have sound programs in most of these components, but there are gaps that need to be filled. Major findings from each of the components are described below.

Air Quality Evaluation

This portion of the audit covers how air quality data are used by State and local agencies for the purpose of section 107 redesignations, handling newly measured violations of the NAAQS, and keeping the public informed. The vast majority of agencies make their air quality data available to the public in a timely fashion.

Relating ambient data to source impacts is one important area where the audit revealed improvements. The audit indicated that 90 percent of the new violations of the NAAQS were investigated to determine the cause or identify corrective actions. A later survey of the EPA Regional Offices showed that the agencies were investigating the remaining 10 percent.

The majority of the agencies systematically review section 107 designations and submit proposed changes to EPA. Emphasis is strongly in the direction of attainment, however, as less than 1 percent of the requests for redesignations are from attainment to nonattainment, even though new violations continue to occur. Most agencies reported that they review their attainment status at least on a yearly basis.

Emission Inventories

The audit indicated that almost all agencies have inventories for major point sources, but only one-half of the agencies maintain an area source inventory. Point source inventories are relatively current, and agencies plan

to keep them current. Area source inventories are not as comprehensive as they could be. The majority of agencies use a fully automated or partially automated storage and retrieval system.

Many State and local agencies have taken the lead in inventorying sources of toxic substances. There is, however, a lack of national consistency in the sources and specific toxics being inventoried. It also appears that area sources of toxic substances are not being included in the toxic inventories.

This portion of the audit was conducted again in the form of survey questions. Perhaps next year's audit should use the file review method to verify the condition of the inventories.

Modeling

Air quality models are used to relate emission to ambient air quality and hence to determine the necessary control measures. The FY 1985 audit indicated that most agencies are knowledgeable and capable of performing and reviewing most routine modeling analyses. However, the State/local agencies generally do not follow EPA procedures when using non-guideline models. The agencies also appear to have problems in implementing EPA modeling guidance for sophisticated models as approximately one-third of all modeling analyses submitted to EPA had to be returned for revisions. Modeling analyses for emission trades ("bubbles") fared worse than average, with over four-fifths being returned for revisions to the States. It is interesting to note that general modeling analyses performed by industry and submitted to the State/local agencies for concurrence had a similar return rate of approximately one-third. Bubble modeling performed by industry had an even higher return rate of two-thirds.

SIP Evaluation

The CAA clearly envisioned that control agencies would periodically evaluate the relationship between air quality data and source emission data and, where appropriate, submit timely revisions of their SIP control strategies. The FY 1985 audit found that 44 percent of the due or overdue SIP revisions had not been completed by the agencies and of those completed, 27 percent had not been submitted to EPA. The audit also showed that only half of the additional studies that the agencies had committed to complete by the end of 1984 as part of their SIP control strategies had been completed, and 64 percent of the remaining studies were behind schedule. The audit found that many agencies are not comparing their current ozone or carbon monoxide emission inventory with their 1982 SIP projections for the current year. Continuous emission monitoring is being completely implemented by agencies in only 59 percent of all cases.

The audit and a subsequent survey of the EPA Regional Offices also revealed problems with "generic" bubble rules (i.e., rules in which emission trades are handled at the State level without the need for EPA rulemaking).

Information available revealed that some States operated generic bubble rules without ever having received formal EPA approval. This practice places sources that have received individual bubbles under these State programs in jeopardy of potential EPA action to enforce the EPA-approved SIP limits.

A. AIR QUALITY EVALUATION

Introduction

This section contains detailed audit information on how air quality data are used by State and local agencies for the purpose of section 107 redesignations, trend analyses, prioritization of air program activities, and public information. Three main areas are covered: air quality reports, section 107 designations, and new violations.

In the air quality reports area, the audit asked how frequently agencies published air quality monitoring data, the contents of the air quality reports, and the time frame between data acquisition and publication.

The second area evaluated whether section 107 attainment status designations were being reviewed and redesignated, if applicable. The number of redesignations and methods used to review attainment status were requested.

The third area was intended to determine the number of air monitors that revealed any new violations and the type of action taken for each violation.

Major Findings and Conclusions

The air quality evaluation part of the audit showed that 92 percent of all State agencies and 90 percent of all local agencies made air quality reports available to the public. This is an increase over the FY 1984 audit, where 83 percent of all State agencies and 78 percent of all local agencies made air quality reports available. Eighty percent of the agencies reported that they make their air quality data available to the public within 6 months of data acquisition.

On a weighted average basis, the time between data collection and report publication for all agencies that submit reports to the public is between 4 and 5 months. The longest delay reported by any one agency was greater than 18 months.

Most agencies reported that they use air quality data in reviewing attainment/nonattainment designations and prioritizing resources. Eighty-three percent of all State and local agencies systematically review section 107 attainment status designations and submit proposed changes to EPA. Ninety-one percent of these agencies review attainment/nonattainment status at least on a yearly basis. During FY 1984, 106 primary and 166 secondary redesignations were initiated, while 81 primary and 166 secondary redesignations were completed and submitted to EPA for review. The redesignation efforts are generally unidirectional; less than 1 percent of all initiated actions and less than 2 percent of all completed and submitted actions were for redesignations from attainment or unclassifiable to nonattainment. Thus, the viability of the section 107 designation program as a continuing and comprehensive planning tool is seriously in question.

Air quality monitoring detected 58 new NAAQS violations in FY 1984. Of these, investigative action was initiated at 40 sites to determine the cause of the exceedance, or to initiate enforcement action. Twelve of the remaining sites had total suspended particulate (TSP) violations that control agencies

believe are covered under EPA's rural fugitive dust policy and do not constitute violations of the NAAQS for attainment purposes. No action was taken by State and local agencies on six violations.

Response to Individual Questions

Air Quality Reports (A.1.)

The purpose of this audit question is to determine: (1) if State and local agencies make air quality reports available to the public; (2) the contents of the air quality reports; and (3) the time frame between data acquisition and report publication. Specific questions regarding the report's contents are summarized in Table A-1. Based on a review of individual agency responses, the same agencies consistently omitted information listed in Table A-1 from their air quality reports.

The audit determined that 46 out of 50 State agencies (92 percent) and 9 of 10 local agencies (90 percent) made air quality reports available to the public. This is an increase over the FY 1984 audit, where 83 percent of all State agencies and 78 percent of all local agencies made air quality reports available.

The time lag between data collection and publication was calculated to average between 4 and 5 months. All reporting agencies, except one, published air quality reports within 12 months of data acquisition. Seventeen agencies (28 percent) reported a 0 to 2 month lag time, 31 agencies (52 percent) reported a 3 to 6 month lag time, and 11 agencies (18 percent) reported a 7 to 12 month lag time.

Section 107 Attainment Status Designation (A.2.)

The audit determined that 50 State and local agencies (83 percent) systematically reviewed section 107 primary and secondary attainment status designations and submitted proposed changes to EPA. Seven agencies (12 percent) did not review, and three local agencies (5 percent) reported not applicable because of systematic review at the State level.

Twenty-nine agencies reported that 253 section 107 reviews were completed in FY 1984 that did not result in requests for redesignations. Of these reviews, 177 came from one State agency. At the same time, 272 primary or secondary redesignation actions were initiated and 247 actions were completed and submitted to EPA. The results are presented in Table A-2. Less than 1 percent of all initiated actions and less than 2 percent of all completed and submitted actions were for redesignations from attainment or unclassifiable to nonattainment. This appears low in view of the fact that 18 agencies reported that 58 sites recorded new violations of the NAAQS in FY 1984.

TABLE A-1. SPECIFIC QUESTIONS REGARDING AIR QUALITY REPORTS

	Yes		No		NA ^a	
	Number of agencies	Percent	Number of agencies	Percent	Number of agencies	Percent
Did the report cover all criteria pollutants?	49	89	5	9	1	2
Did the report cover all monitors within the agency's jurisdiction?	46	84	8	14	1	2
Did the report enable easy comparison to NAAQS?	54	98	0	0	1	2
Did the report compare current air quality to historical trends?	44	80	10	18	1	2
Did the report show how effective control regulations are at reducing air pollution emissions?	10	18	44	80	1	2
Did the report use graphics to present the data?	41	75	13	23	1	2
Did the report use maps to show locations of ambient monitors?	37	67	17	31	1	2
Did the report describe each of the pollutants?	43	78	11	20	1	2
Did the report describe sampling techniques?	40	73	14	25	1	2

^aOne agency reported that it made air quality reports available to the public, but reported not applicable to all nine questions.

TABLE A-2. NUMBER OF REDESIGNATION BY STATE AND LOCAL AGENCIES

Redesignation	<u>Initiated</u>		<u>Completed & Submitted</u>	
	Primary	Secondary	Primary	Secondary
Attainment or unclassifiable to nonattainment	2	0	4	0
Unclassifiable to attainment	17	2	7	1
Nonattainment to attainment or unclassifiable	87	164	70	165
Total	106	166	81	166

The audit then attempted to determine how agencies review attainment status. Five options were listed: (1) staff notification of violations to agency management, (2) consideration of air quality data for the past 2 to 3 years, (3) consideration of modeled exceedances, (4) consideration of control and emission changes, and (5) investigation into cause of violations. Responses are shown in Table A-3. From Table A-3 it can be seen that all five methods are used by over half of the audited agencies. The method most used is the use of air quality data, while modeling is the least used method.

TABLE A-3. METHODS USED TO REVIEW ATTAINMENT STATUS,

Method	Number of Agencies		
	Yes	No	N/A
Staff notifications of violations to agency management	38	10	12
Consideration of air quality data for the past 2-3 years	50	1	9
Consideration of modeled exceedances	28	18	14
Consideration of control and emission changes	32	15	13
Investigation into causes of violations	36	10	14

Figure A-1 shows the frequency of attainment status reviews by pollutant. Most agencies (92 percent) perform attainment status reviews at least on a yearly basis.

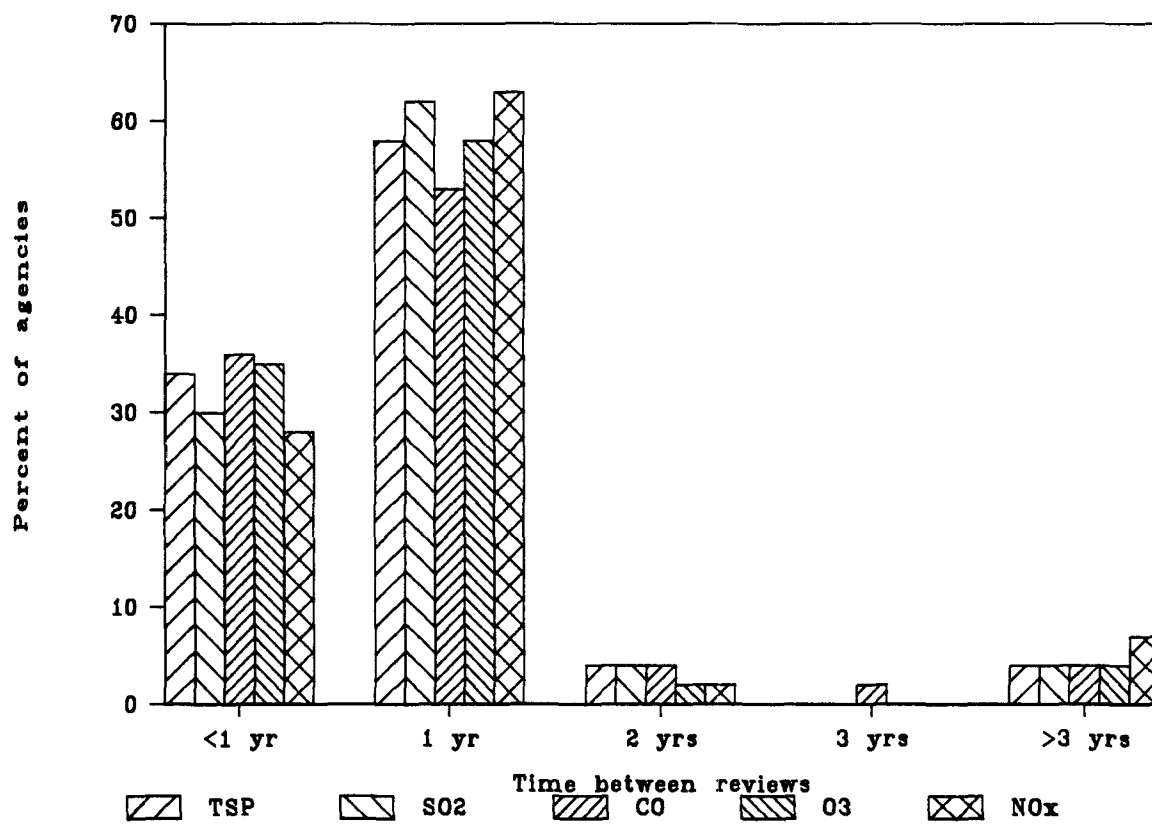


Figure A-1. Frequency of agency attainment status reviews by pollutant.

New Violations (A.3.)

The purpose of this audit question was to determine the number of air quality monitors that revealed any new violations and the type of action taken for each violation. Eighteen agencies (30 percent) reported 58 new violations were detected at air quality monitoring sites in FY 1984. Table A-4 lists the type of action taken for each violation. Of the 58 violations detected, action was initiated on 40 sites (69 percent). Twelve of the remaining 18 sites had TSP violations that control agencies believe are covered under EPA's rural fugitive dust policy and are not considered violations of the NAAQS for attainment purposes. No action was taken on 6 sites; however, a follow up survey of the EPA Regional Offices indicated that the agencies are investigating these violations.

TABLE A-4. ACTIONS TAKEN FOLLOWING AIR QUALITY MONITORING VIOLATIONS

Action	Total Actions Taken	Action initiated	Action completed	Action submitted to EPA
Enforcement action based on existing SIP regulations	3	3	0	0
Change in an individual source permit	1	1	0	0
Source-specific, local, county, or areawide SIP revisions	7	4	1	2
Additional monitoring	6	6	0	0
Verification by modeling studies	1	1	0	0
Data ignored: a documented exceptional event	9	6	1	2
Microscopic examination of filters	7	7	0	0
Other	6	6	0	0
Total	40	34	2	4

B. Emission Inventory

Introduction

Fifty-nine State and local agencies were interviewed to determine the completeness, timeliness and procedures they use to develop, update and document their emission inventories. Agencies were asked to provide information on the status of their point source (both major and minor), area source and mobile source inventories. Pollutants of primary interest were particulate matter (PM), sulfur dioxide (SO₂), CO, VOC, oxides of nitrogen (NO_x), and Pb. Information on inventory activities associated with potentially toxic air pollutants, including sources affected by NESHAP was also obtained.

Major Findings and Conclusions

About 90-95 percent of the 59 agencies maintain an emission inventory for most criteria pollutants; however, only 75 percent apparently maintain an inventory for Pb. Point source emissions were the major focus of these inventories. A smaller number of agencies (55 percent) maintain an area source inventory.

Most of the inventories are fairly current. Approximately half of the (point source) inventories were updated in 1984 or later. About three-quarters have been updated since 1983. Moreover, about 80 percent of the agencies indicate that they plan to update their inventory within the next year. Nevertheless, a few inventories have apparently not been updated in 6-10 years.

Some inventories are not as comprehensive as perhaps they could be. For example, some agencies do not include certain sources in their area source inventory (e.g., fugitive PM emissions from open dust sources, VOC emissions from miscellaneous solvent use, Pb emissions from waste combustion).

About 30 percent of the agencies have an inventory of point sources which emit potentially toxic substances. The number of pollutants, as well as the specific toxic pollutants inventoried, vary considerably from agency to agency. In almost every case, area source emissions of toxic substances are not inventoried.

The majority of agencies use a fully automated or partially automated data system for storage and retrieval of emissions inventory data. Agencies using totally manual data processing procedures are mostly agencies that have a small number of point sources to track.

Agencies reported using various procedures to check the inventory. About two-thirds prepare reports documenting the procedures and assumptions they use to compile the inventory, and about half of these agencies have the report externally reviewed. Most agencies also have established various levels of internal review of the inventory data.

Response to Individual Questions

Approximately 90-95 percent of the agencies* indicated they maintain an emission inventory for PM, SO₂, CO, VOC and NO_x. Seventy-five percent indicated they maintain an inventory for Pb. There are, however, many differences in the scope and content of the inventories from agency to agency. For example, while 90+ percent maintain an inventory of point source emissions, only 55 percent maintain an area source inventory. This is not too surprising, since there is no general requirement to maintain area source inventories on a routine basis (unless the agency is reporting on Reasonable Further Progress (RFP) in a nonattainment area). For mobile sources, most agencies indicated that an inventory is available for their particular area; however, only 50 percent of these agencies stated it is maintained by their agency. In many cases, the inventory is maintained by either the local planning or transportation agency.

Table 1 summarizes the types of inventories maintained by agencies on a pollutant-by-pollutant basis.

* Although 59 agencies were interviewed, a lesser number (50 to 55) responded to any particular question. Unless indicated otherwise, the percents listed in this report are based on the number of agencies interviewed (i.e., 59). To determine the number of agencies responding to a particular question, simply multiply the percentage by 59.

Table 1: Number Of Agencies Maintaining Various Types Of Emission Inventories

	Pollutant					
	PM	SO ₂	CO	VOC	NO _x	Pb
Number With Point Source Inventory	56 (93%)	56 (93%)	54 (90%)	54 (90%)	56 (93%)	44 (75%)
Number With Area Source Inventory	37 (62%)	28 (47%)	32 (53%)	38 (63%)	31 (52%)	18 (30%)
Number With Mobile Source Inventory	(a)	(a)	45 (75%)	40 (68%)	29 (43%)	(a)
Number Of Agencies Interviewed	59	59	59	59	59	59

() Number in parentheses is the percent of agencies, based on the number of agencies interviewed (i.e., 59).

(a) Some, though not all, agencies indicated that they inventory PM, Pb and SO₂ emissions from mobile sources.

A few observations are worth noting. First, with the exception of Pb, there are generally only slight variations in the percents reported among pollutants. This is a relatively consistent finding that will be seen in other comparisons. Also of interest is the finding that only 43 percent of the agencies maintain an NO_x inventory of mobile sources. While it is true there are only a few nonattainment areas for NO_x, an NO_x inventory may be useful for modeling analyses in ozone nonattainment areas. As such, a similar number of VOC and NO_x mobile source inventories would have been expected.

Timeliness Of The Inventory

The audit results provide an indication of how current the inventories are. Information was obtained with respect to when the "complete" inventory was last updated and Table 2 presents this information. About half of the agencies report that the complete inventory was updated in 1984, or later, while about three quarters indicate an update since the beginning of 1983.

Table 2: Number Of Agencies Indicating When The Complete Emission Inventory Was Updated

Year Of Update	Pollutant					
	PM	SO ₂	CO	VOC	NO _x	Pb
1984 (or later)	31 (53%)	31 (53%)	29 (49%)	30 (51%)	30 (51%)	18 (31%)
1983	13 (22%)	13 (22%)	12 (20%)	15 (25%)	14 (23%)	9 (15%)
1982	7 (12%)	7 (12%)	8 (13%)	5 (9%)	8 (13%)	7 (11%)
1981	1 (3%)	1 (3%)	1 (3%)	1 (2%)	1 (3%)	1 (2%)
1976-1980	4 (6%)	3 (4%)	3 (5%)	3 (5%)	3 (5%)	9 (15%)
1975 (or before)	0 (0%)	0 (0%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)
No Response	3 (5%)	4 (7%)	5 (8%)	5 (8%)	3 (5%)	15 (26%)

Mobile Source Emission Factors Used in SIP's

Table 3 provides information with respect to the mobile source emission factors used in the base year mobile source inventory of the current SIP.

Table 3: Mobile Source Emission Factors Used In Current SIP's

	<u>Mobile 1</u>	<u>Mobile 2 or 2.5</u>	<u>Mobile 3</u>	<u>No Response</u>
Number of SIP's:	15 (25%)	26 (44%)	7 (12%)	11 (19%)

As can be seen, 41 agencies (69 percent) indicated that either Mobile 1, Mobile 2, or Mobile 2.5 was used to estimate emissions in the current SIP. This suggests that many mobile source inventories are outdated, since Mobile 3 is now available and revises emission estimates upward considerably, particularly for VOC. Also, only 24 agencies (41 percent) indicated that they now use Mobile 3 to update the inventory. It is not clear why more agencies would not use Mobile 3 to update their mobile source inventory.

Point Source Inventories

The audit obtained information concerning the emission rate cutoff level which agencies use to define a point source. The survey revealed that roughly 50 percent of the agencies use 25 tons/year, or less, to define a point source. Pollutant-by-pollutant information concerning cutoff levels is summarized in Table 4.

Table 4: Number Of Agencies Using Different Emission Rates To Define A Point Source

Cutoff Level (Tons/Year)	Pollutant					
	PM	SO ₂	CO	VOC	NO _x	Pb
1-5	15 (26%)	15 (26%)	13 (22%)	12 (21%)	13 (22%)	25 (43%)
6-10	3 (5%)	4 (7%)	3 (6%)	4 (7%)	3 (6%)	2 (3%)
11-25	15 (25%)	11 (18%)	9 (15%)	9 (15%)	9 (15%)	4 (7%)
26-50	1 (2%)	4 (7%)	1 (2%)	5 (8%)	5 (8%)	0 (0%)
51-100	8 (13%)	7 (12%)	11 (18%)	9 (15%)	9 (15%)	0 (0%)
> 100	0 (0%)	0 (0%)	2 (3%)	0 (0%)	1 (2%)	0 (0%)
No response	17 (25%)	18 (31%)	20 (34%)	20 (34%)	19 (32%)	28 (47%)

Similar information was obtained to determine the cutoff level agencies use to distinguish between a "major" point source and a "minor" point source. With the exception of Pb, most agencies (approximately 75 percent) indicated that they considered sources emitting 100 tons/year, or greater, as major point sources. Most agencies use 5 tons/year, or greater, to define a "major" source of Pb. The significance of being considered a "major" or "minor" source is that less attention is generally devoted to minor sources with respect to obtaining, updating and quality assuring emissions data.

Area Sources

Responses to a number of audit questions provide some perspective with respect to agency activities regarding area source inventories. Of interest was whether agencies include certain sources in their area source inventory (e.g., fugitive particulate emissions, nonreactive VOC's). For example, of the agencies who reported to have an area source inventory:

27 agencies (73 percent) reportedly include fugitive open sources (e.g., paved and unpaved roads) of particulate matter.

24 agencies (63 percent) apparently exclude nonreactive emissions of VOC.

29 agencies (76 percent) said that they include VOC emissions from miscellaneous solvent use.

7 agencies (39 percent) stated that their area source inventories include lead emissions from waste oil combustion.

While many agencies include these categories, as they should, others do not. The lack of consideration of these source categories could have considerable impact if the inventories were used for control strategy development purposes in nonattainment areas.

Updating Of Emission Inventory

A number of questions obtained information about agency plans and procedures for updating inventories. Roughly 80 percent of the agencies stated that they either plan to update the inventory (at least for major point sources) during the next year or that they routinely update their inventory on a continual basis. About 40 percent plan to update minor sources, and 20 percent plan to do so for area sources over the same time period. Table 5 illustrates the reduced level of updating activity for area and minor sources compared to point sources.

Table 5: Number Of Agencies Planning To Update Specified Portions Of Their Inventory, Either On A Continual Basis Or Within One Year

Portion Of Inventory	Pollutant					
	PM	SO ₂	CO	VOC	NO _x	Pb
Major Point Sources	43 (72%)	44 (73%)	46 (77%)	44 (74%)	43 (72%)	21 (52%)
Minor Point Sources	23 (38%)	22 (37%)	25 (42%)	25 (42%)	24 (40%)	16 (27%)
Area Sources	13 (22%)	13 (22%)	12 (20%)	11 (18%)	11 (18%)	4 (7%)

Agencies were asked to identify the type of procedures they use to update their inventories. Agency responses concerning the use of specific procedures are provided below.

(1) Number of agencies which update point source inventories based on:

	<u>Always</u>	<u>Most Of The Time</u>	<u>Sometimes</u>	<u>Never</u>	<u>No Response</u>
Source Inspection	14	14	26	4	2
Source Permit Expiration	17	9	13	13	8
Source Reporting	26	13	16	3	2
Source Test	24	14	17	3	2
Source Permit Application	28	14	5	11	2
Continuous Emission Monitor Report	6	3	21	22	8

(2) Number of agencies which update point sources based on:

	<u>Always</u>	<u>Most of The Time</u>	<u>Sometimes</u>	<u>Never</u>	<u>No Response</u>
Changes in Emission Controls	42	11	3	0	4
Shutdown of Sources	45	6	5	1	3
New Sources	47	7	3	1	2
Malfunctions	7	3	20	25	5
Change in Source Activity or Production	26	17	12	2	3
New Inspection or Enforcement Information	22	10	23	2	3

(3) Number of agencies which update area and mobile sources based on:

	<u>Always</u>	<u>Most Of The Time</u>	<u>Sometimes</u>	<u>Never</u>	<u>No Response</u>
Change in Census or Population Estimates	20	9	9	8	14
Change in Employment Estimates	9	4	15	16	16
Change in Fuel Use Estimates	14	7	12	12	15
Change in VMT Estimates	29	2	5	4	20

It is interesting to note that continuous emission monitoring data are apparently not used in many cases to update the inventory. It is not clear why this may be so since continuous monitors conceptually provide the best estimate of emissions from a source. Of further interest is the fact that not all agencies reported making changes to the inventory, even in cases when a point source shuts down.

Inventory of Non-criteria Pollutants

The audit obtained information concerning inventory activities associated with non-criteria pollutants, including sources emitting (a) potentially toxic substances; (b) hazardous or toxic pollutants regulated by NESHAP (mercury, beryllium, asbestos, vinyl chloride, and benzene); and (c) those pollutants regulated under the section 111(d) of the Clean Air Act. Section 111(d) pollutants are non-criteria pollutants for which NSPS have been set.

Approximately 30 percent of the agencies compile inventories for various potentially toxic substances. Virtually all of the inventories focus exclusively on point sources (i.e., area sources were not inventoried). There is considerable variations with respect to the number of toxic substances inventoried. For example, some agencies reported that they inventory around 6-10 pollutants, while others inventory as many as 800-1000 pollutants.

About 40-50 percent of those agencies which have been delegated authority to regulate NESHAP sources maintain an inventory of those sources. Roughly 30 percent of the agencies indicate that they also inventory sources emitting pollutants affected by section 111(d) of the Act. This response may be misleading, since sources of 111(d) pollutants (fertilizer plants, sulfuric acid plants, kraft pulp mills, and primary aluminum plants) may not be located within each of the jurisdictions administered by the agencies.

Data Checks

The audit focused on procedures that agencies use to check their inventory. Many agencies said that they perform a number of activities with respect to documenting and reviewing the inventory data.

For example, about 75-80 percent of the agencies reportedly perform some type of edit checks (e.g., extreme value checks) of their point source inventory data. Similar results were obtained when agencies were asked about consistency checks of emission factors among source types. About 60 percent of the agencies indicated these checks are performed on point sources, while 20-25 percent of the agencies perform these checks on area and mobile sources. Inventory data are internally reviewed by various staff personnel (e.g., enforcement, planning, permit staff), as well as by the supervisor in about 60-70 percent of the agencies.

In addition, about two-thirds of the agencies indicated that they prepared reports describing the inventory, assumptions and procedures, with about half of these agencies having the reports reviewed by external groups.

Computerization And Report Formats

The majority of agencies interviewed indicated that they use a fully automated or partially automated data system for storage and retrieval of emission inventory data. Agencies using totally manual data processing procedures are mostly agencies that have a small number of point sources. Most States that have automated systems use them for storage of point source data. Four of the States that do not have an automated system for storing point source data indicate that they have a need for such a system. Only about half of the agencies use an automated system for storage of area source data. Some of these use their system only for limited applications, such as for storage of data for certain urban areas or for "minor" point sources. Nine agencies indicated that an area source system is not available but is needed.

For nearly all cases, computerized data handling systems are capable of computerized editing of data and are capable of producing an annual National Emissions Data System (NEDS) report. Most systems operate in batch mode for storage and retrieval of data. This appears to be a satisfactory situation for most States. Only two States indicate no need for a batch retrieval capability, saying instead that they use interactive retrievals exclusively. Interactive retrieval capability is available for 21 agencies. Eleven others indicated that they do not have this capability but would find it desirable. A few comments were provided that interactive retrievals, although desirable, are not used because of high cost.

About 80 percent of responses indicate that the systems are or should be sufficiently "user-friendly" to permit non-ADP personnel to use the system. Roughly the same proportion of responses indicates that systems are, or should be, able to store both current and historical data for tracking RFP and should be capable of storing emissions and enforcement/compliance data in the same file. These are some of the design criteria for the new Aerometric Information and Retrieval System (AIRS) facility data system to be developed by EPA. The States' responses indicate that if the AIRS system is to meet State needs, it should be "user friendly," have the capability to store both emissions and enforcement data, and be capable of tracking emission trends. The AIRS should provide both interactive and batch access capabilities. In order for States to make use of the interactive capabilities, the expense to the States should not be excessive.

The survey results do not reveal a great deal about the States' level of satisfaction with their current systems. The greatest needs appear to be for more "user-friendly" access capabilities, more efficient interactive retrievals, and merging of emissions with enforcement data in those States that have not already accomplished this.

What Conclusions Can Be Drawn From The Audit Responses?

There are a number of observations that can be drawn from the audit. However, it is important to consider two points while interpreting the responses to the audit questions.

First, the responses to similar questions did not always result in similar responses. For this and other reasons, it is recommended that the numbers and percentages presented in this analysis be viewed more as qualitative indicators rather than as absolute numbers.

Secondly, the audit sought general information on emission inventory procedures that are used by 59 different agencies. It is important to realize that there is no uniform inventory requirement that applies to all areas. For example, more complete, comprehensive and up-to-date inventories for point, area and mobile sources are typically required in nonattainment areas than in attainment areas. As a result, it is not entirely possible to conclude from the information provided if agencies are adequately (or inadequately) compiling inventories which meet specific requirements. The audit results should, therefore, be viewed more for general trends in various inventory activities, rather than to attempt to determine specific gaps or limitations with ongoing programs. With these caveats in mind, the following conclusions are presented.

Almost every agency maintains emission inventories for criteria pollutants. These inventories focus primarily on point sources, although mobile and area source inventories are included to a lesser degree. Point source inventories are relatively current, and agencies' plans to keep them current are noteworthy. Most agencies appear to make reasonable efforts to compile a comprehensive inventory of point sources. Many agencies use various means to estimate emissions for a source, even if an emission factor is not readily available. Most agencies who are required to track RFP believe that their inventory is useful for performing this function. Further, agencies have incorporated a number of internal and external checks into the emission inventory system, which give some confidence that credible emission inventory data bases, particularly for point sources, are being collected.

On the other hand, some information from the audit suggests that area source inventories may not be as comprehensive as perhaps they should. Certain sources may not be included, and some area source inventories may be outdated. Mobile source inventories may suffer, since, in some areas, the agency responsible for air pollution control does not have direct responsibility for the mobile source inventory. Accordingly, the RFP concept is not as precise a tool for tracking progress toward attainment of the NAAQS as EPA originally intended.

With regard to toxics, agencies should be applauded for taking a leadership role in inventorying sources of toxic substances. Judging from the responses however there is an apparent lack of consistency in both the specific pollutants and number of pollutants being inventoried. Also, it appears that agencies may be ignoring area sources of toxic pollutants which have been found to contribute a considerable portion of the total risk within a particular area. Some effort to foster a greater degree of consistency and completeness among air toxic inventories appears to be needed.

C. MODELING

Introduction

This section summarizes the detailed audit information on the air quality modeling capabilities of State and local agencies. The intent of the audit was to determine the technical adequacy of modeling analyses and the degree of nationwide consistency with EPA modeling guidance. In order to make this determination, the State/local agencies and the EPA Regional Offices were asked to respond to questions in five areas: (1) training and experience of State/local agency modeling staff; (2) availability of computer hardware and software for performing modeling analyses; (3) deviations from recommended EPA modeling techniques; (4) Regional Office review of State/local modeling analyses; and (5) State/local agency review of industry modeling analyses.

A key area for assessing the State/local agency's ability to perform technically adequate analyses is the adequacy of the education and experience level of the agency's modeling staff. The agencies were asked to describe their staff's training and experience in meteorology and/or modeling, and to identify the staff's experience with both simple and complex modeling issues.

A second area for determining the ability of the agency to deal effectively with modeling problems is the availability of the physical resources (hardware and software) necessary for performing the analyses. The agencies were asked to indicate whether they had access to UNAMAP models, and if so, whether they had the "in-house" expertise to use the models.

The agencies were asked to discuss deviations from EPA recommended models and data bases that were used for regulatory modeling analyses. Reasons were solicited for using alternative models or data bases not specifically recommended in EPA modeling guidance.

The questions in the final two areas concerned the EPA review of State/local agency modeling analyses and State/local agency review of industry modeling analyses. The intent of the questions in these two areas was to determine the degree of consistency with EPA modeling guidance and the technical adequacy of modeling analyses.

Major Findings and Conclusions

Some general observations about the degree of consistency and technical adequacy in modeling done by the agencies can be made based upon the responses to the audit. It is important to realize that the resources required by an agency for modeling analyses depend on a number of factors and vary widely from agency to agency. Such factors as the number of modeling problems, complexity of suitable models, level of detail required for input data bases, meteorological and topographic features, and other technical issues, determine an agency's ability to effectively deal with modeling problems. These factors, along with the case-by-case requirements of many modeling analyses, make it difficult to assess the specific difficulties that the agencies have in implementing EPA modeling guidance. For these reasons, the audit responses should be viewed more for the general problems experienced by the agencies, rather than an attempt to determine specific limitations of modeling programs.

Most of the State/local agency personnel responsible for air quality modeling appear to have adequate training and experience in air pollution meteorology. About one-third of those performing modeling have a degree in meteorology, and another 50 percent have an engineering/technical degree with formal training in air pollution meteorology.

Based upon the audit results, it was not possible to determine whether the agencies had sufficient personnel resources to deal with their modeling problems. A review of the complexity of each modeling analysis on a case-by-case basis would be necessary to make that assessment. One important observation about the agencies personnel resources is that about one fourth of the agencies lack a single person with modeling training or experience. Although these agencies reported very few regulatory modeling applications during FY 1984, there is a potential for future problems as new modeling issues arise.

Most agencies have the physical facilities (hardware and software) available to the staff to perform modeling analyses. Most of the agencies have access to some of the UNAMAP models, but only 55 percent of the agencies reported having access to the most current version 5 of UNAMAP. To ensure consistency, the agencies should all be accessing the most current version of UNAMAP models.

Although the majority of analyses performed by the State/local agencies follow EPA modeling guidance, one half of the agencies found it necessary to use techniques not specifically recommended in EPA guidance at least once during FY 1984. Twenty-two agencies reported using a non-recommended model, primarily because the alternative model was judged to be technically more appropriate for the situation than the recommended model. However, these agencies rarely employed a performance evaluation to judge the superiority of the alternative model.

Sixteen out of 59 agencies reported cases where EPA's recommendation for using 5 years of off-site or 1 year of on-site meteorological data was not followed. These agencies cited unavailability of data or cost of running 5 years of data as reasons for not following EPA guidance.

Based upon response by the EPA Regional Offices, the State/local agencies appear to have problems implementing EPA guidance regarding regulatory modeling. Thirty-two percent of all modeling analyses submitted for review to the EPA Regional Office by the State/local agency were returned for revision. These analyses required revision because the agency did not know, understand or follow EPA guidance, or because the analysis was considered to be technically inadequate. Perhaps some mechanism should be provided to promote a better understanding among the State/local agencies concerning the requirements for regulatory modeling.

Responses to Individual Questions

Training and Experience (Questions C.1a-f)

Question C.1a was asked to determine both the number and the educational background of staff who normally use air quality models. The intent of the question was to determine whether the personnel who routinely perform modeling at the agency had adequate training in the use of air quality models.

The responses to this question show that of the 167 agency personnel that perform modeling, 55 (34 percent) have a college degree in either meteorology or atmospheric science, 82 (48 percent) have a college degree in a technical field and also have had some formal meteorological or dispersion modeling training, and 27 (18 percent) have a college degree in a technical field but have no formal training in meteorology or dispersion modeling.

Of the 60 agencies responding to this question, 12 agencies (20 percent) did not have any personnel with either an atmospheric science degree or formal training in dispersion modeling. Most of these agencies responded to later questions that they had few modeling applications, used only screening models, or had used contractors to perform the analyses. The remainder of the agencies had at least one person with modeling training.

Question C.1b asked for the experience level of the modeling staff. The results were as follows: 25 percent have less than 2 years of modeling experience, 22 percent have 2-5 years experience, 37 percent have 6-10 years experience, and 16 percent have more than 10 years experience.

Part c of Question C.1 concerned the agency's capabilities to execute EPA models. A majority of the agencies (86 percent) had the ability to run EPA screening models in-house. Most agencies (80 percent) could also run refined EPA models in simple circumstances. About two-thirds of the agencies reported the ability to run refined EPA models in-house in all types of circumstances.

Question C.1d asked the agency to identify the most complex air quality model that had been used for regulatory applications and the models most commonly used by the staff. Nearly half of the agencies listed either the ISCLT or ISCST models as the most complex that they had used. These agencies typically used the ISC models for PSD review, SIP-related modeling, and downwash analysis. A smaller number of agencies reported the use of models such as MPTER or CRSTER as the most complex model used for regulatory applications. Seven agencies reported using city-specific EKMA for urban ozone applications, and one agency had used the Urban Airshed Model for a SIP analysis. Two agencies listed MESOPUFF as their most complex modeling application for determining Class I PSD increment consumption and for acid deposition studies. The models most commonly used were screening models such as PTPLU and PTMAX.

Question C.1e was asked to determine if the agency staff has used EPA's "Interim Procedures for Evaluating Air Quality Models" for evaluating non-guideline models. Thirteen agencies responded positively. They employed the procedures for evaluating nonguideline modeling techniques relating to urban/rural dispersion coefficients, complex terrain representations, and

averaging times. Each of these 13 agencies employed at least one staff person with at least 5 years of modeling experience.

Question C.1f concerned development of nonguideline models. Nineteen agencies (32 percent) had modified guideline models or had developed new nonguideline models. There were a variety of reasons for the circumstances that required use of a nonguideline model. Some of the changes to guideline models were modifications to the existing model's algorithm for averaging times, downwash and plume rise computations, dispersion coefficients, and terrain representations. New nonguideline models were developed for applications such as area source emissions from toxic waste sites and techniques for chemical mass balance receptor analyses.

Table C-1 contains the information from questions C.1 a, b, c, e, and f.

TABLE C-1
Modeling Training and Experience

	<u>Meteorology Degree</u>	<u>Technical Degree with Modeling Training</u>		<u>Technical Degree without Modeling Training</u>
C1a What is the training of the staff that performs modeling?	34%	48%		18%
	<u>< 2 Years</u>	<u>2-5 Years</u>	<u>6-10 Years</u>	<u>> 10 Years</u>
C1b What is the experience level of the modeling staff?	25%	22%	37%	16%
		<u>Yes</u>	<u>No</u>	<u>NA</u>
C1c* Can staff run EPA: screening models?		86%	7%	7%
refined models in simple circumstances?		80%	13%	7%
refined models in all circumstances?		63%	27%	10%
		<u>Yes</u>	<u>No</u>	<u>NA</u>
C1e* Has staff used EPA's procedures for evalu- ating nonguideline models?		22%	68%	10%
		<u>Yes</u>	<u>No</u>	<u>NA</u>
C1f* Has staff developed nonguideline models in-house?		32%	58%	10%

*Percentages are based on the number of agencies audited

Access, Expertise, and Use (Questions C.2a-c)

The first part of Question C.2a asked for the UNAMAP version number used by the agency. Fifty-five percent of the agencies accessed Version 5 (most current), 17 percent accessed Version 4, 3 percent used Version 3, and 25 percent failed to respond.

The second part of Question C.2a asked the agency if they have access to and expertise in using 22 UNAMAP models, and if so, how many FY 1984 applications did they have with each model. The models were assigned to four categories: (1) models recommended in the "Guideline on Air Quality Models (1978)"; (2) models recommended in the "Regional Workshops on Air Quality Modeling: A Summary Report (1981)"; (3) EPA and other screening techniques; and (4) other nonguideline models.

Models in the first category included APRAC-1A, AQDM, CDM, RAM, CRSTER, TCM, TEM, and HIWAY. Most agencies (78 percent) had access to these models, and 68 percent had in-house expertise in the use of these models. There were about 430 applications of these models in FY 1984, with the CDM, RAM, and CRSTER models having the most applications.

The second group of models included ISCLT, ISCST, MPTER, and CDMQC. Again, most agencies had both access to and expertise in the use of these models. There were about 542 applications of these models, with the ISCST being used the most.

The third group included the screening models PTMAX, PTDIS, PTMTP, PTPLU, VALLEY, and COMPLEX I, as well as agency-specific screening techniques. Eighty-eight percent of the agencies had access to and 83 percent had expertise in the use of screening models. Nationwide in FY 1984 there were about 1,900 uses of either the EPA screening models or agency-specified screening techniques. A majority of these applications used the PT-type models or the VALLEY model. A few agencies have developed their own algorithms for screening analysis.

The last category included EKMA, Urban Airshed, PAL, and PLUVUE, along with other agency-specified models. There were about 300 uses of models in this category, most of which employed EKMA, CALINE-3, or an agency-specific model.

The number of modeling applications varied considerably from agency to agency. The average number of uses per agency was about 52 in FY 1984, with a range of 0-349. It was not possible to determine the complexity of each modeling application. From this portion of the audit, therefore, it could not be determined whether the agency had adequate staff to conduct the number of applications that were reported.

Question C.2b asked the agencies to identify the method of access to dispersion modeling programs. One-half of the agencies had access to an in-house dedicated computer, 37 percent used telephone lines to access a nonagency state/local computer, 27 percent used telephone lines to communicate with EPA's computer, and 7 percent used a private firm's computer. Several agencies had access to models on more than one system.

Question C.2c was asked to determine if the agencies had the expertise to modify the software for UNAMAP models, and, if so, to identify which models had been modified. Two-thirds of the agencies reported that their staff has the capability to modify the algorithms of the models. Many of the software modifications that have been made can be grouped into two general categories: (1) changes to the input/output format in order to make data entry simpler or report output easier to read; and (2) changes that were necessary to get the model to compile and run on the agency's computer. The agencies involved were convinced that neither of these types of modifications should cause the model to compute results that are different from the guideline model result. However, a few agencies made modifications to UNAMAP programs that would significantly change the results of the model.

Table C-2 contains the information from the questions discussed above.

TABLE C-2

Accessibility, Expertise, and Use of Models

		<u>5</u>	<u>4</u>	<u>3</u>	<u>CD</u>
C2a1	Which version of UNAMAP does staff access?	55%	17%	3%	25%
C2a2	Summarize general capabilities with the following types of models:	<u>Access</u>	<u>Expertise to Run</u>	<u># of FY 1984 Applications</u>	<u># of FY 1984 Applications</u>
	EPA Guideline Models	78%	68%	430	14%
	Models recommended in EPA Regional Workshop Report	78%	73%	542	18%
	EPA Screening Techniques	88%	83%	1792	58%
	Other Models	68%	60%	300	10%
C2b	How are models accessed?	<u>In-House Computer</u>	<u>State/Local Computer</u>	<u>EPA Computer</u>	<u>Private Computer</u>
		41%	30%	22%	7%
C2c	Does staff have ability to modify software for models?	<u>Yes</u>	<u>No</u>	<u>NA</u>	
		67%	25%	8%	

Nonrecommended Modeling Techniques (Questions C.3a-d)

Question C.3a asked the agencies to report the number of regulatory modeling analyses performed by the agency in FY 1984 where it was necessary to use techniques not specifically recommended in EPA guidance. (Note: One State reported a very high number of modeling analyses. These analyses were not included in the statistics in this section in order to keep the discussion representative of the other 59 agencies that responded.) The responses indicated that 352 out of 1,734 modeling analyses used some nonguideline technique. The reasons for using the nonguideline technique were solicited in Questions C.3b and C.3c, relating to eight specific nonguideline techniques.

The use of a nonguideline model was reported in 213 cases. For most of these analyses, the agencies reported that the nonguideline model was judged to be technically more appropriate for the given situation than the guideline model. However, in only a small percentage of these cases was the nonguideline model chosen to be more appropriate because of a detailed performance analysis of the guideline versus nonguideline model.

There were 16 analyses performed using a guideline model that had been modified to use a nonguideline technique, 20 cases of using a nonrecommended option of a guideline model, and 15 cases of using a guideline model outside of its stated limitations. There were many reasons why nonguideline modeling techniques were used, but there was not enough detail given to determine if there were any specific areas where the agencies had problems with the EPA guidelines.

The agencies were asked to indicate the number of modeling analyses that did not use recommended EPA guidance in four areas related to meteorological data, background concentrations, treatment of calms, and design of receptor network.

There were 135 cases where the agencies did not follow EPA's recommended use of 5 years of off-site or 1 year of on-site meteorological data. The two reasons most often cited for not following the EPA's recommendation were that 5 years of off-site or one year of on-site were not available to the agency, or that the agency had determined a "worst case year" to be used instead of the full 5-year period. One agency cited the cost of running the models as the reason for not following EPA guidance.

There were many fewer cases of not following EPA guidance in the other three areas. Agencies reported 32 cases related to the background air quality determination, 13 cases related to treatment of calm wind conditions, and 18 cases related to receptor network design. There was not sufficient detail in the responses to determine specific problems that the agencies had with EPA guidance.

The final question in this area concerned the degree of concurrence by the EPA Regional Office with the nonguideline techniques employed by the State/local agency. Fifty-two of the nonguideline modeling analyses were approved by EPA without major reanalysis by the agency, and only 10 were not approved by EPA. EPA concurred with three analyses only after major revisions to the analyses were made by the agency. Only four analyses involving nonguideline techniques are still awaiting a decision by EPA. Finally, 115 of the analyses were never submitted or did not require EPA concurrence.

Table C-3 contains the information discussed above.

TABLE C-3

Use of Nonrecommended Models

		<u>Recommended Techniques</u>	<u>Nonrecommended Techniques</u>
C3a	How often were nonguideline modeling techniques used in FY 1984?	1,449 (80%)	352 (20%)
C3b	When nonrecommended models were used, indicate how often the following alternatives were used:	213 Use of nonguideline model 16 Modification of guideline model 20 Use of nonrecommended option of a guideline model 15 Use of guideline model outside its stated limitations 16 Other	
C3c	When nonrecommended data bases were used, indicate how often the following aspects of the modeling analyses were important:	135 Use of less than 5 years of off-site or less than 1 year of on-site meteorological data 32 Use of nonguideline techniques for determining background 13 Use of nonguideline techniques for treatment of calms 18 Use of nonguideline techniques for design of receptor network	
C3d	When nonrecommended techniques were used, indicate how often EPA ultimately concurred with the analysis:	28% EPA concurred without reanalysis 2% EPA concurred after major reanalysis 5% EPA did not concur 2% Awaiting EPA decision 63% EPA concurrence not sought	

EPA Review of Agency Analyses (Question C.4)

The intent of this question was to determine the frequency of approval/disapproval of State/local agency modeling analyses by EPA when approval or action by EPA is required. The EPA Regional Office was asked to provide the number of analyses reviewed by EPA, the number of analyses requiring revision, and the factors that contributed to requiring a revised analysis. The responses were grouped into six regulatory areas: (1) bubble (emission trades); (2) section 107 redesignations; (3) NSR (including PSD); (4) nonattainment area SIP analyses; (5) Pb SIP's; and (6) other SIP modeling.

Thirty two percent of all modeling analyses submitted for review to the EPA Regional Offices were returned to the State/local agency for revision. For bubble applications, 13 of 15 analyses reviewed by the EPA Regional Office required a revision to the original analysis. From the responses, it appears that there is not a particular factor that contributed to requiring a revised analysis. Rather, it appears that the State/local agency had general problems understanding and responding to EPA guidance related to modeling for emission trades.

Twenty-eight percent of the analyses in the other five areas were sent back to the State/local agency for revision. The primary factor contributing to requiring a revised analysis was that the original analysis was judged to be technically inadequate by EPA. There was insufficient detail available from the survey to identify specific problem areas that required reworking of the State/local agency analysis.

Table C-4 shows the types of modeling applications and the number that required revision by the agencies.

TABLE C-4

EPA Review of Agency Analyses

C4 Indicate the number of analyses requiring EPA approval and the results of EPA's review in the following areas:

	<u># of Analyses Reviewed</u>	<u># of Analyses Requiring Revision</u>
Bubble (emission trades)	15	13
Section 107 redesignations	68	25
New source review (including PSD)	104	11
Nonattainment area SIP analyses	21	12
Lead SIP's	19	8
Other SIP modeling	33	13
Totals	260	82

What were the contributing factors that required a revised analysis?

9%	Agency did not know or ask for EPA guidance
20%	Agency misinterpreted or misunderstood EPA guidance
18%	Agency misapplied or did not follow EPA guidance
0%	No guidance available from EPA
36%	The analysis was judged technically inadequate by EPA
18%	Other

Agency Review of Industry Analyses (Question C.5)

This question asked the State/local agencies to identify the number of analyses submitted by industry to the agency for review and the result of that review. The agencies were to list the contributing factors that required a revised analysis. The responses were grouped into five categories: (1) bubbles (emission trades); (2) section 107 redesignations; (3) NSR, including PSD; (4) Pb SIP's; and (5) other source-specific SIP modeling.

State/local agency review of modeling analyses performed by industry resulted in 32 percent (124 of 393) of the analyses being sent back to the responsible party for revision. Every area except Pb SIP's had a high percentage of the analysis returned for revision. Thirty-six percent of those analyses requiring revision were considered to be technically inadequate by the reviewing agency. Forty-eight percent required revision because the responsible party either was unaware, did not understand, or did not follow agency guidance for the particular analysis.

Table C-5 shows the types of modeling applications and the number returned to industry by the agencies.

TABLE C-5

Agency Review of Industry Analyses

C5 Indicate the number of analyses performed by industry requiring concurrence by the control agency and the results of the agency's review in the following areas:

	<u># of Analyses Reviewed</u>	<u># of Analyses Requiring Revision</u>
Bubble (emission trades)	12	8
Section 107 redesignations	13	11
New source review (including PSD)	268	85
Lead SIP's	15	1
Other source-specific SIP modeling	85	19
Totals	<u>392</u>	<u>124</u>

What were the contributing factors that required a revised analysis?

11%	Responsible party did not know or ask for agency's guidance
13%	Responsible party misinterpreted or misunderstood agency's guidance
23%	Responsible party misapplied or did not follow agency's guidance
2%	No guidance available from State or local agency
36%	The analysis was judged technically inadequate by agency
15%	Other

D. SIP EVALUATION AND IMPLEMENTATION

Introduction

An evaluation of SIP development and implementation activities was designed to assess whether State plans for attainment are being reasonably carried out. The evaluation was also designed to identify needs of State and local agencies in developing and updating SIP's. This section of the report summarizes major findings in these areas and presents detailed information in each of the audit areas. Audit questions covered by the SIP Evaluation and Implementation section of the Air Quality Planning and SIP Activity audit include:

Timeliness of Regulatory Development,

Timeliness of Studies,

Regional Consultation,

Transportation Control Measures,

Reasonable Further Progress,

Source Activity,

Continuous Emission Monitoring, and

Generic Bubbles.

Major Findings and Conclusions

The SIP evaluation and implementation audit identified that 44 percent of the SIP revisions and strategies due or overdue by the end of 1984 had not been completed, and of those completed, 27 percent had not been submitted. In addition, the audit found that 43 percent of the revisions and strategies incomplete were behind schedule.

Attempts were made to determine causes for delays to SIP revisions and strategies. Survey results were inconclusive. Questions asked included if there was a tracking system, and if governmental oversight caused delays. No correlation was found between those agencies that did not have a formalized tracking system and regulatory delays. Likewise, no additional delay was found for those agencies that reported governmental oversight problems vs. agencies that did not have governmental oversight. For those agencies reporting governmental oversight problems, State laws and State procedures would have to be revised to alleviate the problem.

The audit also determined that a very significant number (48 percent) of additional studies (such as nontraditional TSP or CO hotspots) due by the end of 1984 had not been completed, and that 64 percent of these were behind schedule.

The audit determined that agencies regularly consulted with EPA Regional Offices concerning bubbles and other source-specific revisions. Regional

Offices, however, were only consulted in slightly over half the cases involving variances. Agency staff personnel responsible for source-specific revisions stated that they had access to current EPA policy and criteria concerning SIP revisions.

The audited agencies indicated that an unusually high number (87 percent) of all transportation control measures required by SIP's were being implemented, while 6 percent of the required TCM's were not being implemented. Seven percent of the agencies did not respond. Additional review of TCM implementation and effectiveness may be in order in future audits.

It was found that many agencies are not comparing changes in emission inventories with projected emission changes given in the O₃ or CO RFP curve in the SIP. For O₃, 72 percent of all cases were tracked to ensure reasonable further progress (RFP). For CO, only 37 percent of all cases were tracked to ensure RFP. As previously noted under the Emissions Inventory section, RFP as originally contemplated for long-term tracking and planning may not be a viable tool.

Continuous emission monitoring required under 40 Part 51.19 was being completely implemented by State and local agencies in 59 percent of all cases, partially implemented in 13 percent of all cases, and not implemented 28 percent of the time.

Based upon the data available from this audit and a subsequent follow-up survey of EPA Regional Offices, it appears that the issue of EPA-approved generic bubble rules must be clarified. States that are operating generic programs without EPA approval are placing the "impacted" sources in jeopardy of potential EPA actions to enforce the original SIP limits. Also, the submission of approved generic bubble actions to EPA by States should be increased.

Responses to Individual Questions

Timeliness of Regulatory Development (D.1.)

One of the purposes of the audit was to determine how effective State and local agencies are in revising and adopting State implementation plans and 111(d) plans. Questions asked in this regard were intended to identify if there are delays in regulatory development, and if so, to determine the type of delays so corrective action could be implemented. EPA Regional Offices provided to each agency a list of SIP revisions or strategies that were due or overdue by the end of 1984. The list included Part D plans, non-Part D plans, and other SIP requirements. States were requested to complete a table showing whether action had been completed and submitted, completed and not submitted, not completed but on schedule, or not completed and not on schedule. National summaries to this question are shown in Table D-1. Of the 256 revisions or strategies due or overdue by the end of 1984, States and local agencies responded to approximately 99 percent. Overall, 141 out of 256 revisions or strategies had been completed (55 percent), while 112 had not been completed (44 percent). Of those not completed, 64 of 112 (57 percent) were on schedule, while 48 (43 percent) were not on schedule.

TABLE D-1. TIMELINESS OF REGULATORY DEVELOPMENT

No. cases	Completed		Not Completed		No response
	Submitted	Not Submitted	On schedule	Not on schedule	
Part D Plans	132	64	15	27	3
Non-Part D Plans	84	28	14	30	0
Other SIP Requirements	40	11	9	7	0
Total	256	103	38	64	3

The audit then asked if agencies tracked implementation of these activities using a management system with key dates and periodic reports, or whether a staff person was assigned to track all dates on a periodic basis. Seventeen of 61 agencies (28 percent) reported that they used a management system; 23 agencies (38 percent) assigned a staff member; and 6 agencies (10 percent) did both. Eight agencies (13 percent) either did not track dates, had no formal procedures, or used other mechanisms to assure implementation. Eleven agencies (18 percent) did not respond to the question. No correlation was observed between those agencies that did not have a formalized tracking system and regulatory delays.

The audit also questioned whether delays in State action were due to required approval at a level above the agency, e.g. legislative or executive branch oversight, and if so, the length of such delays. Twenty-three of 61 agencies (38 percent) reported delays in State action due to oversight, while 31 agencies (51 percent) reported no oversight delays. For seven agencies (11 percent), the question did not apply. Of those responding positively, nine agencies (39 percent) stated that legislative oversight caused delays, while eight agencies (35 percent) stated executive oversight (including environmental and pollution control boards, caused delays. The remainder of the responses did not fix blame with one branch of government or another.

Figure D-1 shows the length of delays for those agencies responding affirmatively. The weighted average length of such delays was 9 months. One agency reported a 2 year delay. Again, responses to this question were compared with regulatory delays to determine whether a correlation existed between delays in regulations and legislative or executive oversight. No correlation was observed.

For those agencies that reported delays due to governmental oversight, the audit questionnaire asked which of the following action would reduce delays:

EPA discussion with appropriate State officials,

Revision to State's internal procedures,

Revision to State regulation,

Revision to State law,

Revision to State constitution, or

Other changes.

Of the 23 agencies that reported delays due to government oversight, 18 agencies responded to the question. Because these questions are not mutually exclusive, many States responded more than once. Of the 30 suggested actions received, 3 (10 percent) stated EPA discussion with State officials would help, 8 (27 percent) would need to revise State internal procedures, 1 (3 percent) would need to revise State regulations, 13 (43 percent) would need to revise State laws, and 1 (3 percent) would need to revise the State constitution. There were four other responses, such as no action, or EPA should change its policy. Figure D-2 graphically presents the responses to the question.

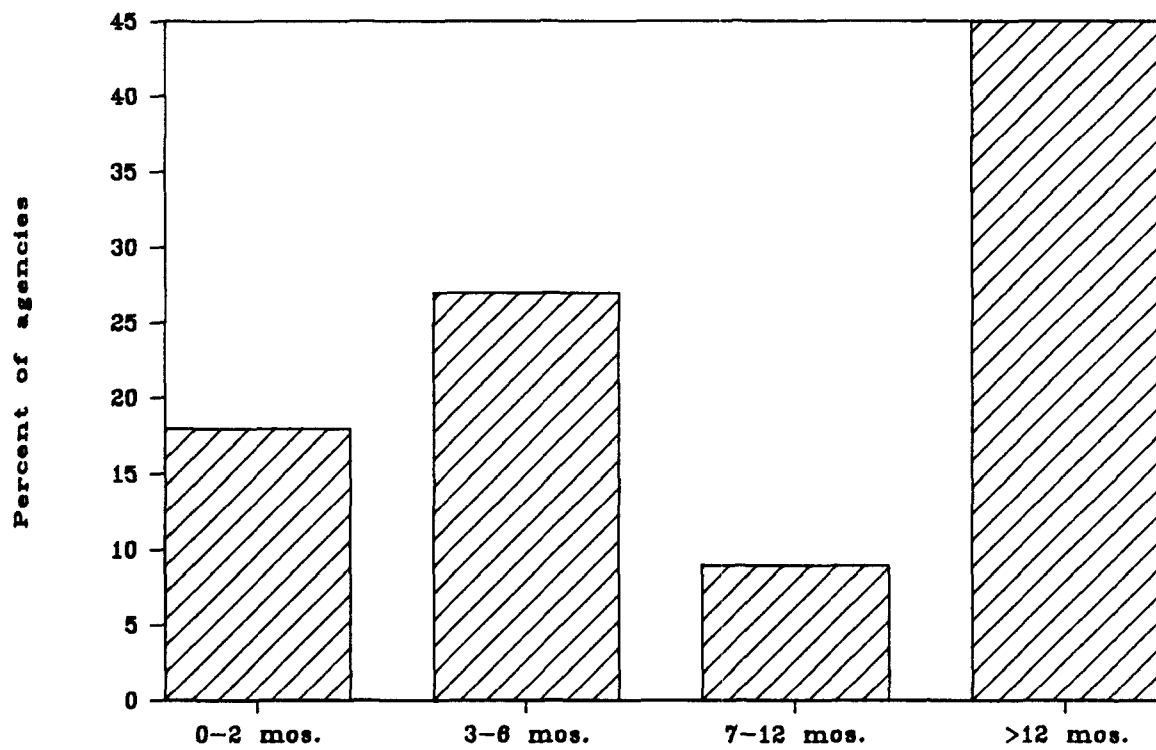


Figure D-1. Length of delays due to oversight

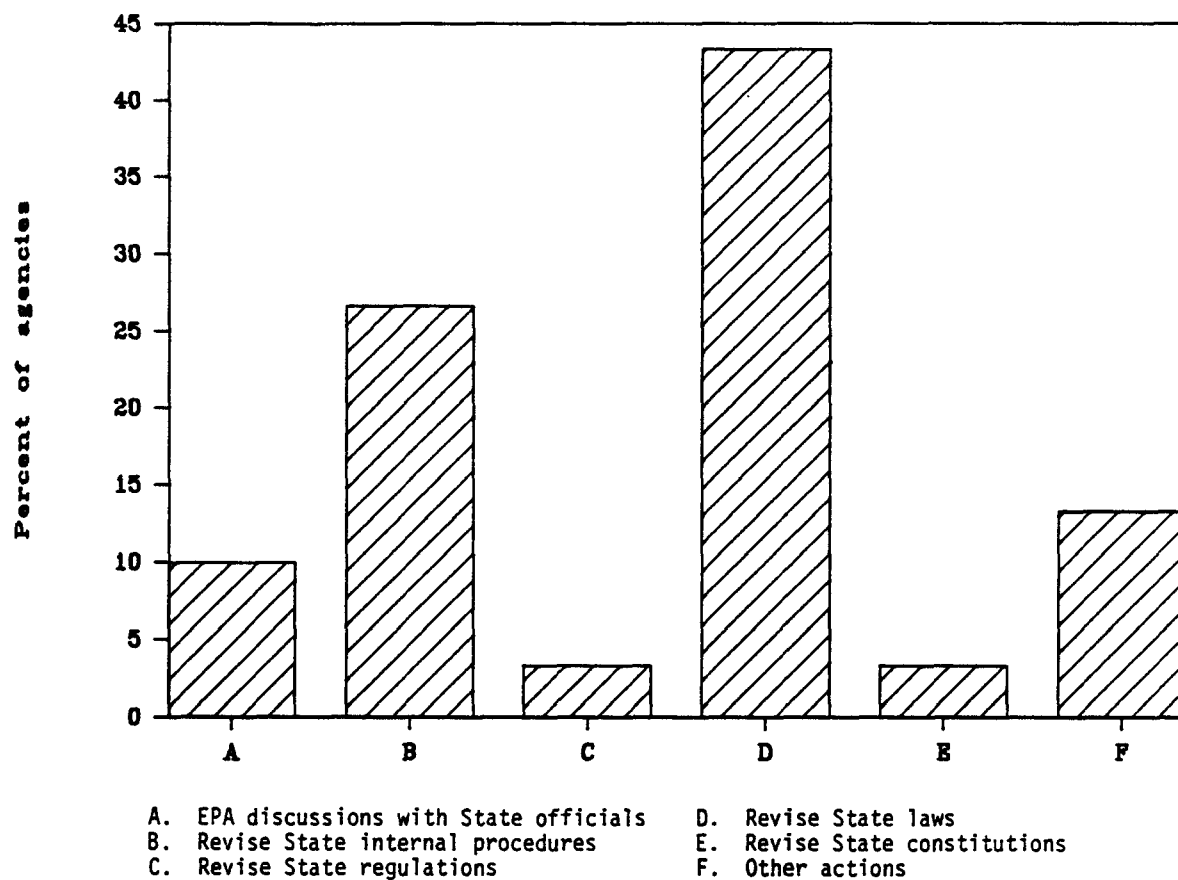


Figure D-2. Actions to reduce government oversight.

Timeliness of Studies (D.2.)

EPA Regional Offices provided to State and local agencies a list of additional studies, such as nontraditional TSP or CO hot-spots, that were due by the end of the 1984. As in "Timeliness of Regulatory Development," agencies were requested to complete a table showing whether action had been completed and submitted, completed and not submitted, not completed but on schedule, or not completed and not on schedule. Of the 46 cases listed by the Regional Offices, 24 had been completed (52 percent) while 22 (48 percent) were not completed. Of those completed, 6 cases (25 percent) had not been submitted to EPA. Of those not completed, 14 cases (64 percent) were behind schedule.

Regional Consultation (D.3.)

EPA Regional Office were asked how often State and local agencies consulted with them formally before submitting SIP revisions. According to Regional Office responses, State and local agencies consulted on 18 variances and submitted 31, consulted on 38 bubbles and submitted 38, and consulted on 41 other source specific actions and submitted 41. Although the reported number of consultations and submittals are the same for bubbles and for other actions, this does not mean that State and local agencies consulted with EPA prior to each submittal. In 34 percent of these cases, agencies either consulted with EPA and did not submit revisions, or submitted revisions without consultation.

State and local agency officials were then asked if staff personnel responsible for source-specific revisions had access to all current EPA policy and criteria concerning SIP revisions. Forty-seven of 61 agencies said yes (77 percent), one agency said no (2 percent), and 13 agencies either did not respond, or the question was not applicable (21 percent).

Agency officials were then asked how guidance was disseminated within each agency. The agencies that answered affirmative to the question above distributed copies of EPA guidance to the appropriate personnel. Of these, 25 agencies indicated that they also used other methods of disseminating information, such as using a policy manual, a summary memo, or periodic staff meetings.

Transportation Control Measures (D.4)

EPA Regional Office supplied State and local agencies with a list of transportation control measures (TCM's) that were to be implemented in accordance with the SIP. Agencies were then asked whether the TCM's were being implemented. Of the 294 measures listed by the Regional Offices, the agencies stated that 255 measures (87 percent) were being implemented, and 17 measures (6 percent) were not being implemented. This positive implementation response seems extraordinarily high. No answer was given for 22 measures.

State and local air pollution control officials were then asked to indicate how the air pollution control agency tracked TCM implementation.

Of 33 agencies required to implement TCM's in accordance with their SIPs, 28 (85 percent) tracked TCM implementation by receiving reports from the implementing agencies. Eighteen air pollution control agencies, some of whom also received reports, had membership on the Metropolitan Planning Organization (MPO) committee that enabled them to track TCM implementation.

Reasonable Further Progress (D.5.)

Section 172 of the CAA requires SIP's to provide for revision and resubmission of emission inventories to ensure RFP toward attainment. EPA Regional Offices provided a list of O_3 and CO extension areas to State and local agencies and asked if the agency compared changes in the emission inventory with projected emission changes given in the O_3 or CO RFP curve in the SIP. Of the 78 O_3 areas listed by the Regional Offices, agencies reported that 56 areas (72 percent) were tracked to ensure RFP, 15 areas (19 percent) were not tracked, and 7 areas (9 percent) had no response. Of the 83 CO areas listed by the Regional Offices, agencies reported that only 31 areas (37 percent) were tracked to ensure RFP, 46 areas (55 percent) were not tracked, and 6 areas (7 percent) had no response. Figures D-3 and D-4 show the O_3 and CO responses.

Agencies that answered affirmative to O_3 and/or CO tracking were then asked if they prepared a report of the comparisons, if the report had been submitted to EPA, and if the report was made available to the public. Twenty-two agencies indicated that they prepared a report of the comparisons, 18 agencies stated that they submitted the report to EPA, and 8 agencies made the report available to the public. Based on the response to this question, the RFP program cannot be considered as viable an effort as originally contemplated by EPA.

Source Activity (D.6.)

The audit questionnaire asked how often State and local agencies periodically compared actual source activity (i.e., increases or decreases in growth) with past projections. Forty-five of 61 agencies responded (74 percent). Of the respondents, 21 agencies compared actual source activity every 1 to 2 years (47 percent), 9 agencies (20 percent) compared actual source activity every 2 to 5 years, while 15 agencies (33 percent) compared actual source activity at intervals greater than 5 years.

Continuous Emission Monitoring (D.7.)

Part 51.19 of EPA's regulations on SIPs requires agencies to adopt continuous emission monitoring (CEM) for selected categories of existing stationary sources. These categories include steam generators, nitric acid (HNO_3) plants, sulfuric acid (H_2SO_4) plants, and fluidized bed catalytic cracking units. Agencies were to respond if they required CEM completely, CEM partially, or no CEM. These responses are summarized nationally in Table D-2. For those agencies responding that had sources within their jurisdiction, 59 percent completely required CEM, 13 percent partially required CEM, and 29 percent did not require CEM.

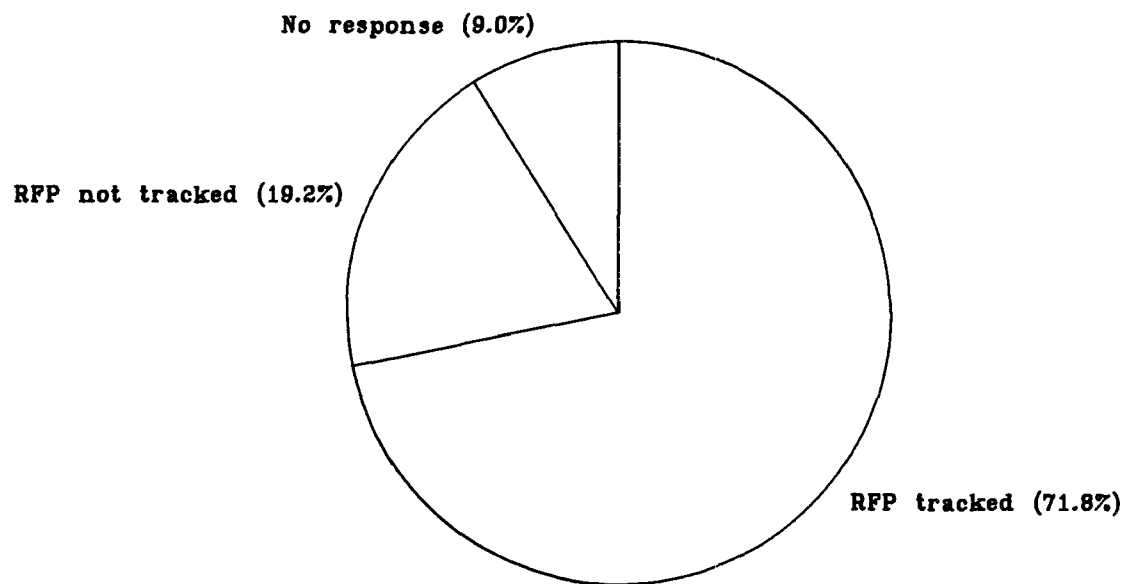


Figure D-3. RFP tracking for ozone.

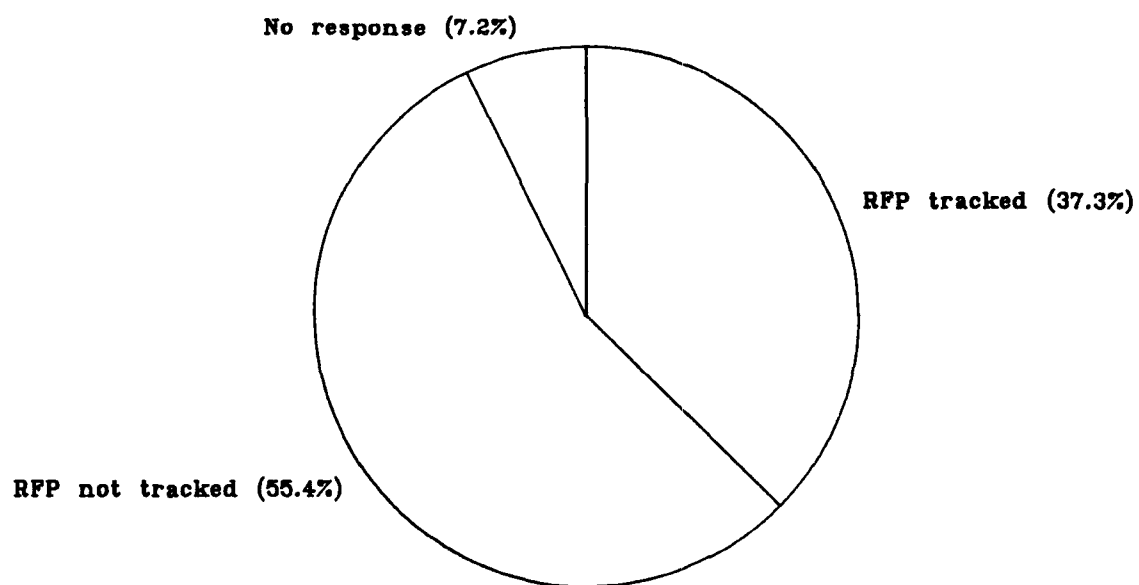


Figure D-4. RFP tracking for carbon monoxide.

TABLE D-2. SUMMARY OF CONTINUOUS EMISSION MONITORING REQUIREMENTS

	Yes (Completely)		Yes (Partly)		No		No Sources		No Response	
	No.	%	No.	%	No.	%	No.	%	No.	%
Fossil fuel-fired steam generators greater than 250 MMBTU/hr heat input, with a capacity factor greater than 30 percent										
- Coal fired:										
-- Opacity	28	45	6	10	14	23	7	11	7	11
-- SO ₂ (only for units with SO ₂ controls)	21	34	5	8	9	15	19	31	8	13
-- NO ₂ (only for units >1000 MMBTU/hr in AQCR's w/NO _x control strategy and NO _x emission >0.7 times NO ₂ emission standards)	14	23	3	5	6	10	30	48	9	15
-- O ₂ or CO ₂	19	31	6	10	13	21	16	26	8	13
- Oil or oil/gas-fired with violations or controls -- Opacity	20	32	6	10	10	16	18	29	8	13
HN0 ₃ plants >300 ton/day of 100 percent HN0 ₂ in AQCR's w/NO ₂ control strategy: -- NO ₂	10	16	1	2	4	6	39	63	8	13
H ₂ SO ₄ plants >300 ton/day of 100 percent H ₂ SO ₄ : -- SO ₂	20	32	2	3	6	10	26	42	8	13
Fluidized bed catalytic cracking units with feed >20,000 bbls/day: -- Opacity	16	26	2	3	10	16	27	44	7	11

Generic Bubble Rule (D.8.)

States and local agencies were asked in the audit questionnaire if they had a generic emission trading (bubble) rule, if EPA had approved the rule, and the number of bubbles submitted to the EPA Regional Offices in FY 1984. Also, in preparing this report, the Office of Air Quality Planning and Standards has included clarifying information obtained from the EPA Regional Offices after the individual audit reports were completed.

Nineteen States indicated in the questionnaire that they have generic bubble rules. Of the 19, only 8 have generic rules which have been formally approved by EPA. To have operable programs, the remaining States should either have these overall rules approved by EPA rulemaking or submit individual bubble actions to EPA as SIP revisions. If States do not, the source may be subject to EPA enforcement action (because the source is not in compliance with the EPA-approved SIP).

Bubbles Issued Under EPA-Approved Generic Rules

State and local agencies were asked in the questionnaire to indicate the total number of bubbles ever issued under their generic rules. Six of the agencies with EPA-approved generic rules have issued only four bubbles (total) under these rules. Two of these four individual bubbles were submitted to EPA for approval anyway.

The audit results indicated that the other control agencies with approved generic rules have issued about 31 individual bubbles. Fifteen of these 31 were granted by one State. Many of these 15 generic bubble actions have problems. After consultation with the appropriate EPA Regional Office, it was determined that most if not all, have averaging periods longer than 24 hours, although the State does not have the authority under its EPA-approved generic rule to issue bubbles with averaging times in excess of 24 hours.

Consultation with the Regional Offices revealed that some of these same 15 bubbles may also have the following problems:

- Not all VOC bubbles for surface coating operations were calculated on a solids-applied basis. (This has the effect of making the State emission limit less stringent than the approved SIP.)
- Some of these bubbles were granted for sources in differing nonattainment demonstration areas. (This error probably adds emissions to a control strategy demonstration with no corresponding deduction in that same area--i.e., there is no bubble.)

The Region has written to this State identifying these problems.

Of the 16 remaining bubbles issued under generic rules by the other State, two of these were explicitly reviewed by the EPA Region and found to have problems. The difficulties uncovered were--

- revoking the SIP limit on a source (increasing emission) while failing to tighten the limit on other sources (decreasing emission); and
- failing to identify the sources providing credit and establishing no source-specific limits on sources providing credit.

The quality of the other 14 bubbles in this State is unknown.

Bubbles Issued under Generic Rules Not Approved by EPA

Forty-eight bubbles were approved by States under generic rules that were not approved by EPA. All these bubbles should have been submitted to EPA for formal approval. Three of the bubbles approved by one State were submitted to EPA for approval. One State refused to submit any of its 15 bubbles. A second State would not submit any of its 18 bubbles because it did not see a need to. A third State has been informed that it needs to submit its 12 bubbles, but has only submitted 2 since the audit. Lack of formal EPA regulatory action on these individual bubbles again places the sources in question in jeopardy of EPA enforcement action based on the approved SIP limits.

The audit could not determine if there are other States with generic rules that were not reported.

IV. NEW SOURCE REVIEW

EXECUTIVE SUMMARY

EPA made a notable change in its method for gathering information for the FY 1985 new source review (NSR) audit. This change involved the shift from last year's comprehensive interview of agency staff to an almost exclusive focus on the examination of agency permit files. This change added a new dimension to the audit in that while EPA could continue to evaluate the performance level of the State and local agencies, it is also able to gain a better perspective of how the problems identified affect the collective population of permits being issued.

For FY 1985, the NSR audit once again examined the seven major audit topics originally selected by the NSR audit committee for the FY 1984 audit. The seven audit topics and an overview of the findings for each topic are provided below. EPA conducted on-site audits of 64 air pollution control agencies, including 48 States,¹ the District of Columbia, Puerto Rico, the Virgin Islands, and 13 local government programs.

Altogether, the audited agencies processed approximately 17,150 permits for new and modified sources of all types and sizes during the time period upon which this audit report is based. In turn, EPA auditors spent slightly less than 950 hours examining to varying degrees a total of 748 permit files. Auditors carried out a comprehensive examination of about 60 percent of these files by completing detailed questionnaires in accordance with the FY 1985 NAAS guidance. These questionnaires were then forwarded to EPA Headquarters, keyed into a computerized audit data base, and analyzed to prepare this national audit report.

This year's audit findings support many of the findings from the FY 1984 NSR audit. That is, the findings again indicate that most agencies perform their overall new source review program responsibilities reasonably well, although, in a number of State and local agencies, problems were identified with respect to the consistent and adequate application of certain specific program requirements. In addition, auditors occasionally mentioned that noticeable improvements had already been observed in the performance of some agencies where specific deficiencies had previously been found. This is certainly to the credit of these agencies in their efforts to improve in-house performance and to strive for a greater level of national consistency.

¹ The State of California does not have authority to issue permits and does not implement a preconstruction review program. Instead, all source permitting activities in California are performed by local air pollution control districts. A new source review audit was not done for the State of Hawaii during FY 1985 because of an EPA Region IX decision not to conduct an on-site agency visit.

Public Notification Procedures

Overall, agencies generally complied with the public participation requirements as applied to major sources, although EPA found some inconsistencies in the informational content of the public notices. However, while most proposed permits for NSR/PSD sources were announced to the public for an opportunity to review and comment, the majority of other permits were not. This was demonstrated by the fact that EPA found evidence of public notification in only 38 percent of the non-NSR/PSD permits which auditors examined. Moreover, more than 40 percent of the agencies reportedly did not issue public notices for any of the non-NSR/PSD permits which EPA examined.

Many agencies are reluctant to go through the formal notification process for each and every permit that they review. EPA agreed, as a result of last year's similar findings, to reassess the SIP requirement which, when literally interpreted, requires public notification for all permits. While this reassessment is being made, EPA plans to continue evaluating and reporting on each agency's public notification procedures for all permits. However, EPA will be more critical in its assessment of how well agencies apply their procedures to major new and modified sources.

Applicability Determinations

A significant number of agencies continued to experience difficulties with the way that they carry out the source applicability process. EPA believes that approximately 15 percent of the audited permits not reviewed under PSD or NSR requirements probably should have been. In addition, the lack of sufficient file documentation often precluded EPA's ability to adequately evaluate the agencies' applicability determinations.

EPA identified various types of problems, but most pertain to the way that agencies account for a new or modified source's emissions in order to determine whether a major review would be required under either PSD or nonattainment area regulations. One particular problem pertains to the misuse by numerous agencies of the concept of "potential to emit" which involves the use of Federally enforceable permit conditions to properly restrict a source's potential emissions (as is often attempted in order to enable a source to avoid major source review). EPA intends to provide guidance to agencies providing ways to correctly apply the concept of "potential to emit." One way in which this will be done is through training courses beginning in early 1986.

BACT/LAER Determinations

Agencies generally did a good job of applying the BACT requirements to PSD sources and applicable pollutants. However, EPA concluded that the quality of the analysis performed to select the level of control defining BACT on a case-by-case basis could be improved in some instances. As was the case last year, EPA also found that when a PSD source was subject to NSPS, agencies had a strong tendency to accept the use of the applicable NSPS to define BACT. Even though examples of BACT determinations more stringent than NSPS were identified in PSD permits issued by 12 of 24 agencies, BACT was established at levels required by NSPS for approximately 80 percent of the pollutant determinations.

Agencies showed far less tendency to use NSPS for LAER determinations in nonattainment areas. Slightly over 50 percent of the time, agencies required pollutants to be controlled at levels more stringent than the applicable NSPS. Nevertheless, these findings suggest that BACT and LAER requirements do not yet have the technology-forcing effect that Congress had envisioned when it established the requirements, and that EPA needs to provide more explicit guidance for making BACT/LAER determinations.

Ambient Monitoring

This year's audit substantiated a finding that EPA made last year. That is, agencies commonly allow PSD applicants to comply with the preconstruction monitoring data requirements by relying upon existing ambient air quality data instead of new data collected from a special source-operated monitoring network. EPA accepts the use of such existing data if it can meet certain criteria for representativeness. Of concern to EPA is the finding that in almost half of the cases where agencies accepted existing data, the permit files (a) offered no documented basis for allowing its use, or (b) contained some description of the data but failed to adequately address or meet all of the EPA criteria.

Ambient Impact Analyses

EPA verified that agencies generally required ambient impact analyses to be conducted where needed to ensure protection of the increments and NAAQS. In addition, most agencies generally used or required the use of the appropriate models and model options to complete the NAAQS analyses. However, certain questions arose concerning the quality of these analyses in a number of cases. With respect to both PSD increment analyses and NAAQS analyses, agencies did not appear to consistently give thorough attention to significant emissions from existing sources (major and minor) located within the impact area of the proposed source. Another key problem was the lack of sufficient documentation of the details of the analyses. This prevented EPA from being able to adequately evaluate the adequacy of the analyses contained in a significant number of files.

Emission Offset Requirements

Only 20 percent of the audited agencies issued NSR permits to major sources in nonattainment areas during the audit period. EPA's examination of the NSR permits provided no indication of any nationally significant problems. As with other phases of the audit, however, EPA encountered problems with inadequate file documentation and this hindered an adequate evaluation of the full creditability of some of the emission offsets that agencies required.

Permit Specificity and Clarity

This year's audit raises the same concern that was originally described last year about the enforceability, and more specifically the Federal enforceability, of some of the permits which agencies are issuing. The acceptable use of physical and operational limitations to restrict the year-round operation and production capacity of a source hinges upon the Federal enforceability of the limitations. EPA auditors questioned the enforceability of such presumed limitations in a number of cases where sources had been allowed to avoid major source review.

A. INTRODUCTION

For FY 1985, the new source review (NSR) audit examined the ways that the State and local agencies implement programs for the preconstruction review of new and modified stationary sources. As was the case for the previous year, the FY 1985 audit examined the seven basic topics which were selected by the NSR audit committee. These topics included: (1) Public Notification Procedures (formerly Administrative Procedures), (2) Applicability Determinations, (3) BACT/LAER Determinations, (4) Ambient Monitoring (PSD), (5) Ambient Impact Analysis, (6) Emission Offset Requirements, and (7) Permit Specificity and Clarity.

While the audit continued to examine the same selected NSR topics, the approach differed notably in that the FY 1985 audit focused primarily upon the inspection of State and local agency permit files, instead of gaining information through the interview of agency staff. Thus, the audit findings described herein pertain largely to contents of the permit files in contrast to the focus on agency rules and procedures as described in the FY 1984 audit report.

EPA obtained the information for this audit report through the use of several types of questionnaires: (1) a permit summary questionnaire which each audited agency was asked to complete, (2) an NSR audit summary questionnaire which the EPA auditors completed following the actual onsite audit, and (3) two kinds of permit file questionnaires which were completed by the EPA auditors during the audit. These questionnaires were used to collect information found in a selected portion of the total number of State and local agency permit files which the auditors examined. (Each of the questionnaires was explained in the FY 85 audit guidance manual where copies of each can be found.)

The NSR audit considered information obtained from 64 air pollution control agencies, including 48 States¹, the District of Columbia, Puerto Rico, the Virgin Islands, and 13 local government programs. Where a State program was carried out by one or more offices (i.e., headquarters or central office plus district offices) and more than one of the offices was audited, they considered them all as part of one State program (agency). Local agencies were considered separately, even though there may have been a dependency on the State agency for certain program operations in some cases.

For the time period upon which this report is based, the audited agencies processed approximately 17,150 permits, including 115 PSD and 57 NSR permits. EPA, in turn, examined 87 percent of the PSD permits, 42 percent of the NSR permits, and about 4 percent (624) of the other (non-NSR/PSD) permits.

¹ The State of California does not have authority to issue permits and does not implement a preconstruction review program. Instead, all source permitting activities in California are performed by local air pollution control districts. A new source review audit was not done for the State of Hawaii during FY 1985 because of an EPA Region IX decision not to conduct an on-site agency visit.

While each auditor was encouraged to examine as many permit files as he or she could, the NAAQS audit guidance did not require the completion of a questionnaire for each permit file that was examined during the audit. Instead, a certain minimum number of PSD, NSR, and non-NSR/PSD source questionnaires was prescribed. The total number of permit file questionnaires submitted to EPA Headquarters, and subsequently keyed into a computerized data base and analyzed to prepare the enclosed audit findings, represents about 60 percent of the number of files actually examined. Reference to a percentage of the "total number of audited files" as used throughout this report refers only to those permits which were included in the EPA Headquarters data base, as follows: 59 PSD permits, 14 NSR permits, 5 permits involving both PSD and NSR, and 360 non-NSR/PSD permits.

Some findings of general interest are:

- * For 53 of the 64 agencies that were audited, EPA examined all of the NSR/PSD permits that had been processed during the audit period.

- * No NSR/PSD permits at all were issued by 23 of the audited agencies, while two (2) agencies each issued the highest number (16) of PSD permits;

- * Agencies issued permits to an estimated 1,673 sources whose potential emissions ranged from 100 to 249 tons per year, but whose preconstruction review is typically categorized as a "minor" source review. This is because these sources, locating in attainment or unclassified areas, are not subject to Federal PSD requirements, i.e., they are not listed under 40 CFR 51.24(b)(1)(i)(2). Consequently, for them to be classified as "major" PSD sources, each would have to emit at least 250 tpy of any regulated pollutant.

- * EPA auditors spent approximately 945 hours primarily examining agency permit files. On the average, auditors spent 1-1/4 hours on each permit file and nearly 15 hours per agency audit. Actual review time for individual files ranged from 15 minutes to an unusually high 11-1/2 hours.

Finally, auditors were asked, on the audit summary form, to identify from their own overall perspective, the 5 most significant problems encountered for each agency audit. From the lists of problems submitted, 4 specific problem areas stood out as being the most often mentioned. They are:

<u>Problem Area</u>	<u>Frequency of occurrence</u>	<u>Percent of total</u>
* Applicability determinations	37	21
* Permit conditions	29	17
* Documentation	25	14
* Public participation requirements	<u>21</u>	<u>12</u>
	112	64

Four other problem areas each constituted 5 percent of the total responses: BACT and LAER determinations, PSD increment analyses, dispersion modeling, and NAAQS protection.

B. SUMMARY OF MAJOR FINDINGS

This section summarizes the major findings of the 1985 NSR audit. The findings that are determined to have national implications are discussed in greater detail than are problems which appear to be more isolated in nature. For a better understanding of how the major findings were derived, the reader is referred to Sections IV.C. through IV.I., where a breakdown of the individual audit questions and responses is provided.

1. Public Notification Procedures

- ° While most proposed permits for NSR/PSD sources are announced to the public for review and comment, most other permits are not. EPA found evidence of public notification in only 38 percent of the non-NSR/PSD source permits that were examined. Agency rules excluded approximately half of the minor source permits from the public notification process. (See Figure 1.)

- ° Forty-two (42) percent of the audited agencies did not issue public notices for any non-NSR/PSD permits which EPA reviewed. One third of the agencies issued public notices for all permits reviewed, while 25 percent issued notices for some, but not all, of their audited permits. (See Figure 1.)

- ° Sixty (60) percent of the agencies that issued PSD permits routinely included the information required by regulation for PSD public notices. Only half of the public notices for PSD sources included all of the information required by the PSD regulations. The information most frequently omitted was the description of the source's estimated ambient impact, including the amount of PSD increment being consumed.

- ° Federal Land Managers were not always notified of PSD construction which might adversely affect Class I areas. Sixteen of 22 PSD permits involving construction within 100 km of a Class I area were brought to the attention of the appropriate Federal Land Manager. No record of notification was apparent in the remaining 6 permit files -- each issued by a different agency.

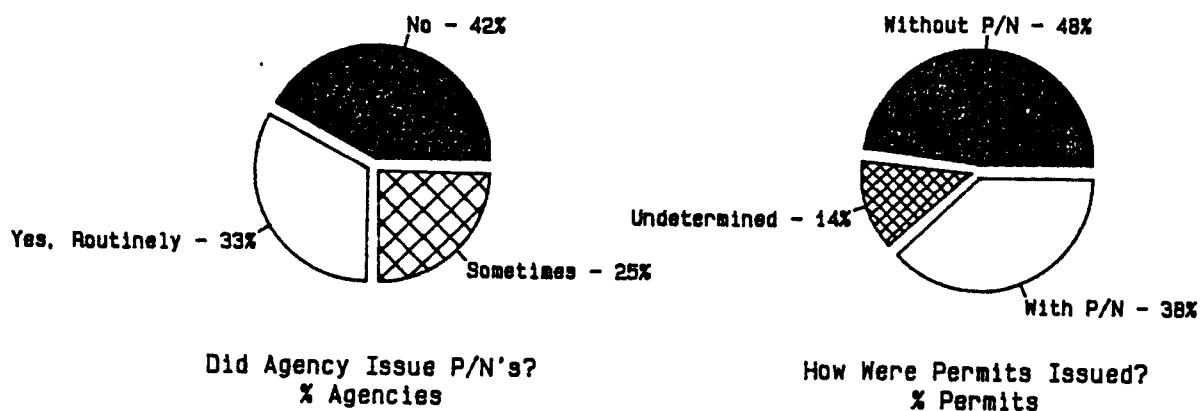
2. Applicability Determinations

- ° A significant number of agencies are experiencing difficulties in adequately carrying out the source applicability process. EPA believes that approximately 15 percent of the audited non-NSR/PSD permit files involved sources that probably should have been reviewed as major sources. A lack of adequate file documentation often precluded EPA's ability to adequately evaluate the agencies' applicability determinations.

- ° EPA found examples where 13 agencies either failed to consider certain pollutant-emitting activities at a source, or improperly interpreted an exemption provision. Only in the latter case, however, were sources enabled to at least partially avoid major source review. (See Figure 2.)

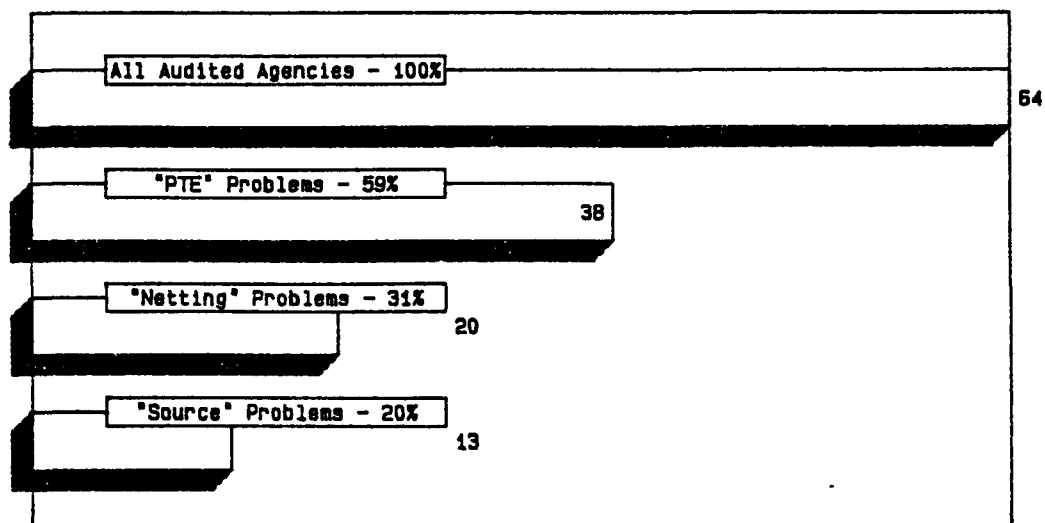
- ° Agencies continue to have problems properly defining a new or modified source's "potential to emit." Thirty-eight (38) agencies had permit files which EPA considered to be deficient in some respect concerning the calculation or use of potential emissions for source applicability purposes. Sometimes,

Figure 1
PUBLIC NOTIFICATION REQUIREMENTS
Agency Performance and Permits Issued



Information based only on non-NSR/PSD permits

Figure 2
APPLICABILITY DETERMINATIONS
Agency Performance



Percentages are mutually exclusive.

but certainly not always, these problems resulted in agencies not subjecting proposed sources to the correct preconstruction review requirements. (See Figure 2.)

- EPA identified 20 agencies who either did not require the proper "netting" procedures to be followed to calculate the change in emissions at a modified source, or did not provide sufficient file documentation to enable adequate evaluation of the agency's procedures. In these agencies, EPA found at least 35 files with procedural or documentation problems. (See Figure 2.)

- EPA found no evidence of the improper "double counting" of emission reduction credits used for netting purposes. Some agencies need to be more careful about ensuring that each emission reduction credit is made Federally enforceable--an important criteria for properly using emission reductions for netting purposes.

3. BACT/LAER Determinations

- Most agencies routinely complied with the PSD requirement for applying BACT to each regulated pollutant emitted in significant amounts. EPA found exceptions in a total of 8 permits issued by 5 agencies. In only 2 agencies did the problem occur in more than 1 permit.

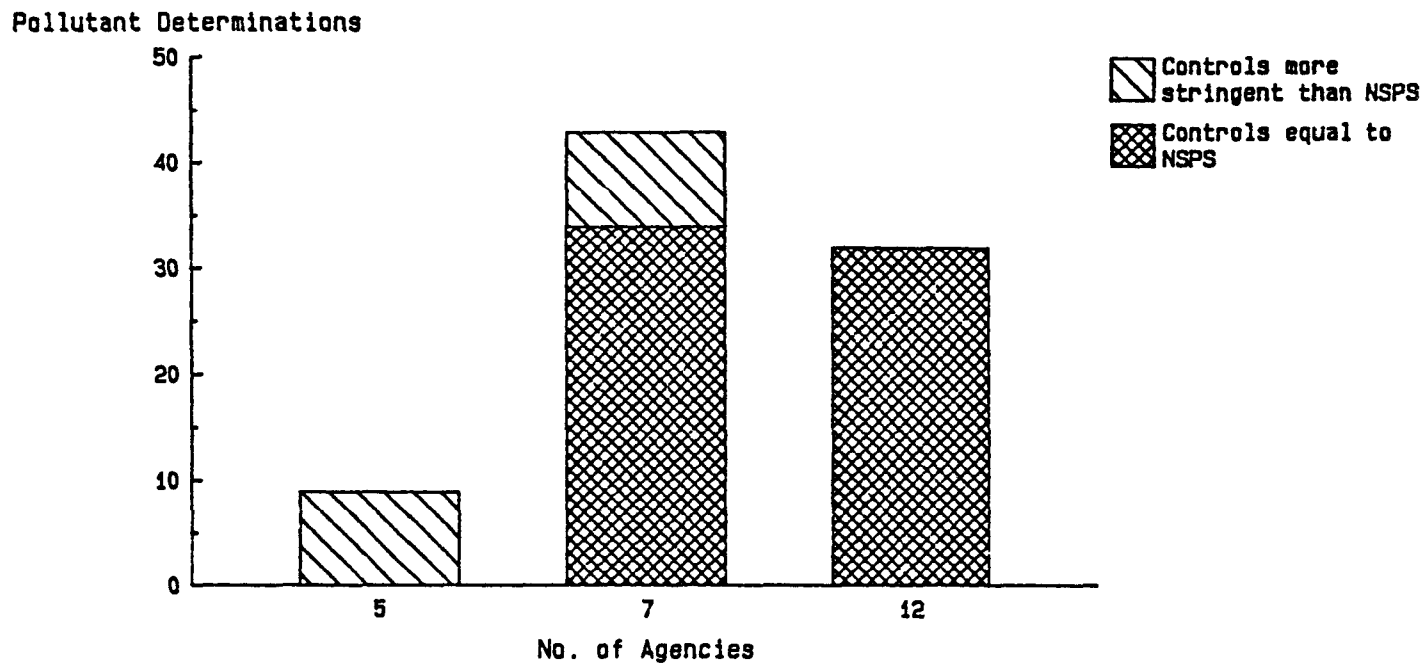
- Approximately 85 percent of the agencies who conducted PSD reviews last year required the evaluation of alternative control strategies as part of the BACT determination process for at least some of the PSD reviews which they conducted. However, one-third of the reviews where alternatives were formally considered failed to fully address the impacts of each alternative in order to properly demonstrate the rationale for selection of a particular control technique.

- Twenty-five (25) percent of the agencies who conducted PSD reviews last year did not appear to consistently check the applicants' BACT analyses to verify their accuracy. EPA concluded that in some cases little or no independent agency review was likely to have occurred, while in other instances it appeared to be more a question of whether the agencies failed to include documentation of their own analyses.

- Collectively, agencies showed a strong tendency to accept the use of the applicable NSPS to define BACT for PSD sources. Even though examples of BACT determinations more stringent than NSPS were found in PSD permits issued by 12 of 24 agencies, BACT was established at levels required by NSPS for approximately 80 percent of the pollutant determinations for BACT (see Figure 3).

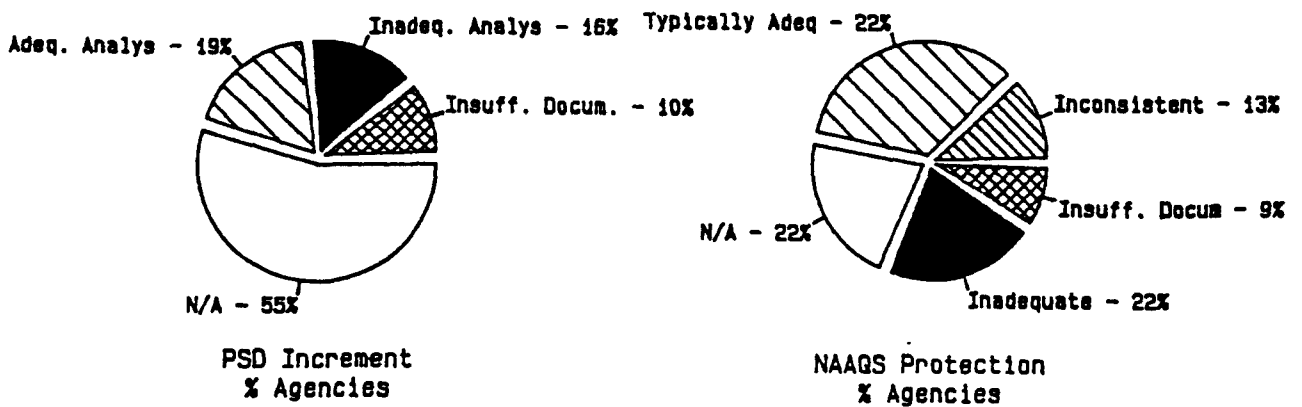
- Agencies showed far less tendency to use NSPS for LAER determinations than for BACT. Agencies required emissions limits more stringent than NSPS to establish LAER in 6 of 11 pollutant determinations, affecting 9 major nonattainment area sources otherwise subject to NSPS.

Figure 3
BACT DETERMINATIONS
Relative Stringency of BACT Determinations



Only pollutant determinations for which NSPS applied were considered

Figure 4
AMBIENT AIR QUALITY ANALYSIS
Agency Performance



4. Ambient Monitoring

° With only a few possible exceptions, agencies typically required PSD applicants to address the preconstruction monitoring requirements where applicable. Where agencies did exempt PSD applicants from the requirements, permit files usually provided an adequate demonstration that the proposed sources' impacts were de minimis. However, 4 agencies failed to explain why a total of 5 sources were totally exempted from the monitoring requirements.

° Twenty (20) agencies required a total of 34 applicants to comply with the preconstruction monitoring requirements. Thirty (30) PSD applicants were allowed to use only existing ambient air quality data. Four (4) agencies each required 1 PSD applicant to monitor for 1 or more pollutants.

° In approximately half of the cases where agencies accepted the use of existing data, the permit files (a) offered no documented basis for allowing its use, or (b) contained some description of the data but failed to adequately address or meet all of the EPA criteria for representative data.

5. Ambient Air Quality Analysis

PSD Increment Analysis--

° Twenty-nine (29) agencies required 46 PSD applicants to meet either the TSP or SO₂ increments or both. EPA found no PSD reviews for which an increment analysis should have been done but was not. However, in more than half of the affected agencies, EPA found that either: (a) the analyses did not adequately address existing major and minor source emissions which also consumed increment, or (b) the permit files did not provide sufficient information to enable auditors to evaluate the analyses. (See Figure 4.)

° With only one exception, agencies typically gave adequate consideration to both long- and short-term PSD increments.

° None of the 16 PSD permits for which agencies required a Class I increment analysis revealed any problems related to special Class I area considerations.

NAAQS Protection--

° EPA did not identify any NSR/PSD permits for which a NAAQS analysis was completely omitted but should have been required. However, 5 agencies were found to have (a) incorrectly omitted certain pollutants from analysis, or (b) lacked a sufficiently comprehensive review of some pollutants.

° Most agencies appear to scrutinize non-NSR/PSD source permit applications individually to determine whether a NAAQS analysis should be done. However, 18 agencies were found to have issued permits to sources who probably should have been subjected to NAAQS analyses but were not. Five (5) of these agencies may not require a NAAQS analysis for any non-NSR/PSD source construction.

° Thirty-one (31) percent of the agencies had files which typically (a) lacked sufficient documentation to enable EPA to determine whether and to what degree source interactions had been considered in the NAAQS analysis,

or (b) omitted significant emissions from other sources in the vicinity of the proposed source. (See Figure 4.)

Dispersion Models--

- Most agencies generally used or required applicants to use the appropriate models and model options in the NAAQS analyses performed. However, the lack of sufficient documentation to fully describe the rationale for the use of particular models and the methods used was a hindrance to the auditors in many instances.

- Apparently, most agencies do not often require minor sources to perform the modeling analysis. Eighty (80) percent of the time, the minor source analyses were performed by the agencies themselves; but in the 15 cases where the applicants did submit an analysis, about half of the analyses did not appear to be adequately checked by the responsible agency.

6. Emission Offset Requirements

- Thirteen (13) agencies issued NSR permits to major sources in nonattainment areas. EPA found a few examples of areas where agencies experienced specific problems but found no examples of emissions offsets that were not Federally enforceable. Also, agencies typically required offsets to occur on or before the time of new source operation and to be expressed in the same manner as emissions used for the demonstration of reasonable further progress.

- Four (4) agencies did not provide sufficient information in their NSR files to enable EPA to adequately evaluate the full creditability of the emission offsets.

- Three (3) agencies did not account for area and minor source growth that had occurred since the last NSR permit and should have been offset by the proposed source.

7. Permit Specificity and Clarity

- Twelve (12) agencies did not appear to routinely state or reference each source's allowable emissions in the applicable permit. The omission appeared to be a common occurrence, at least for non-NSR/PSD sources, in 8 of these agencies.

- At least 15 agencies did not appear to routinely identify each emission unit along with its allowable emission limit in the permits. In some cases, it may be agency policy to do so primarily for PSD permits or where needed to avoid NSR/PSD review.

- Nineteen (19) agencies reportedly either did not at all or did not consistently state or reference compliance test methods in the permits. Where the practice is not followed consistently, it is not clear what criteria, if any, agencies use to determine whether the methods are to be stated or referenced in the permits.

C. PUBLIC NOTIFICATION PROCEDURES

The audit examined State and local agency procedures for notifying the public of proposed permit actions. These procedures were reviewed with specific concern for (1) the types of sources for which notices were issued, (2) the adequacy of the information contained in the notices, and (3) the extent to which other agencies and officials are informed of pending permit actions which could affect their jurisdictions.

1. For which new or modified sources was the public afforded an opportunity to comment on proposed permits?

The FY 1985 audit findings indicate that while most proposed permits for NSR/PSD sources are announced to the public for comment, most other proposed permits are not. Approximately 90 percent of the NSR/PSD permits examined by the auditors were announced through a public notice, while only 38 percent of the audited non-NSR/PSD permits included public notices. In terms of the agencies who issue the notices for proposed permits, the findings support the FY 84 audit results which indicated that approximately one-third of the agencies routinely notify the public of their proposed permits. This year's findings reveal that:

- ° 33 percent of the agencies issued public notices for all of the permits that were examined;
- ° 25 percent issued public notices for some, but not all, audited permits;
- ° 42 percent did not issue public notices for any of the audited non-NSR/PSD permits.

Of the 77 NSR/PSD permit files examined by the auditors, 3 PSD files and 4 NSR files contained no evidence that the proposed permits were announced to the public for review and comment. The three PSD permits were issued by three separate agencies. In one case, the omission of public notification was a processing error apparently resulting from the fact that the source was initially reviewed as a minor source. The second involved a PSD source whose permit was modified and the State did not consider a public notice appropriate (although the EPA Regional Office disagreed). No explanation was provided for the omission of the public notice in the third case. Each of the identified agencies issued at least one other PSD permit during 1984 and for each the public was properly notified.

Four of the 19 audited permit files involving major review in a nonattainment area contained no evidence that public notification had been provided. Three of the four NSR permits were issued by the same agency. Auditors did find that other permits requiring emission offsets were issued by that agency and public notices were issued for those other permits.

With respect to the non-NSR/PSD files, auditors found many permits for which there was no evidence of public notification. Only 38 percent of the audited permit files clearly indicated that public notification occurred. Of the remainder, auditors concluded that 46 percent had been exempted from notification by agency rules, and 2 percent were excluded from notification as a result of a "processing error." The remaining 14 percent of the

questionnaires contained no response at all to this question primarily because of the lack of documentation in the files.

In order to help assess the general value of public notification for non-NSR/PSD permits, auditors were asked to indicate whether the public notices resulted in any comments. Of those minor permits for which a public notice was issued, more than half (55 percent) contained evidence in the files that public comments had been submitted. Most responses did not indicate how many comments had been received, nor were the auditors asked to evaluate the quality of the comments.

2. Do the public notices routinely provide adequate information?

Auditors were asked to determine whether the following items of information, required under the PSD regulations, were included in the public notices issued by State and local agencies:

- a. Opportunity for written comment;
- b. Opportunity for a public hearing;
- c. Description of the agency's preliminary determination to approve or disapprove the permit;
- d. Description of the source's estimated ambient impact;
- e. Statement of the availability of additional information for public inspection.

Of the 38 agencies issuing PSD permits during the FY 1985 audit period, 60 percent routinely addressed the information requirements in an adequate manner. The remaining 40 percent of the agencies were inconsistent at best. Wherever information was omitted from a notice, a description of the source's estimated ambient impact was always missing. Half the time, other required information was missing as well. Overall, only half of the public notices for PSD permits were found to contain all of the required information.

Other types of permits, including those subject to major review in a nonattainment area typically did not contain all the information items listed above. The informational content of non-PSD permits is not as clearly delineated by regulation, so the following is provided primarily for comparative purposes. Frequently omitted from non-PSD permits was the description of the source's estimated impact. Eight agencies did address source impact in some of their notices. Less frequently omitted was the agency's preliminary determination, yet it was not found in 43 percent of the notices.

3. Were other State and local air pollution control agencies and other officials whose jurisdictions might be affected by the proposed new or modified source adequately notified of the proposed action?

Auditors identified 13 agencies where it did not appear that this part of the notification procedure was being adequately carried out. In some cases it was not apparent that outside agencies or officials were notified. In a few cases neighboring States were not informed of a proposed source's impact when appropriate. Approximately 30 percent of the NSR/PSD permit

files contained no evidence of efforts to notify other agencies and officials, including EPA.

EPA policy calls for the notification of the appropriate Federal Land Manager (FLM) when a PSD source would propose construction within 100 km of a Class I area. Twenty-two (22) PSD permits issued by 14 agencies, involved construction within such range. Auditors verified that 16 of the 22 PSD permits were brought to the attention of the appropriate FLM. No record of notification was apparent in the remaining 6 files--each issued by a different agency.

D. APPLICABILITY DETERMINATIONS

The specific types of requirements which are to apply to a proposed new source or modification are generally based on the size of the new source or modification, expressed in terms of its "potential to emit," and the geographic location where the proposed construction would occur (attainment vs. nonattainment area). The task of making the appropriate applicability determinations depends upon the existence of adequate regulations containing the proper definitions and applicability criteria, plus the in-house expertise to correctly apply them to each incoming application for a permit.

EPA auditors examined the selected permit files to evaluate each agency's ability to adhere to the approved definitions of "source" and "potential to emit," and how well each agency verified and corrected, where necessary, the emissions estimates provided by the applicants. As was the case in last year's audit, the overall findings pertaining to applicability determinations suggest that a significant number of State and local agencies are experiencing difficulties in adequately carrying out the source applicability process. Overall, EPA found that:

- * Approximately 15 percent of the audited non-NSR/PSD permit files should have been reviewed as major sources in the auditors' judgment.

- * Another 5 percent of the audited non-NSR/PSD files, did not contain sufficient information about the sources' emissions to enable the auditors to indicate whether the correct applicability determinations had been made.

Described below are the findings as they relate to the various aspects of the applicability determination process.

1. Does the agency properly apply its approved definition(s) of "source"?

EPA found, in 13 agencies, 20 non-NSR/PSD permits for which certain pollutant-emitting activities had not been considered in defining the subject source. However, EPA concluded that none of these sources would have been required to undergo PSD or NSR review.

EPA did, however, identify other problems that, while not related to the definition of source, involved other source-related issues. These source-related problems, affecting 13 agencies, kept sources from being properly regulated under the agencies' permit requirements. No one problem was widespread, and correction of each would appear to require greater attention on the part of each agency to correctly interpret its applicable regulations. EPA identified the following types of problems:

- a. Failure to identify the proper SIC classification for PSD applicability;
- b. Exemption of certain pieces of equipment when determining source emissions increases and decreases;
- c. Improper exemption of temporary, portable, and stand-by sources from PSD review;
- d. Omission from PSD review of significantly-emitted pollutants because of the misinterpretation of "major modification" at a source; and
- e. Failure to document all or part of the applicability process, thus preventing adequate judgment of whether "source" was adequately addressed.

2. Does the agency typically use the best available emissions projections and Federally enforceable limitations in defining a source's "potential to emit"?

The PTE is a source's maximum capacity to emit a pollutant under its physical and operational design. In order for any physical or operational limitation (e.g., less than 24-hour, year-round operation, fuel usage restriction) to be considered part of the source's design, thereby restricting the maximum pollutant-emitting capacity of the source, the limitations must be Federally enforceable. The major status of new or modified sources must be determined on the basis of their potential emissions.

Thirty-eight (38) agencies were found to have a problem with their procedures for establishing a source's "potential to emit" (PTE). Sometimes, but certainly not always, these problems appear to have resulted in incorrect applicability determinations. Problems related to the agencies' determinations of PTE can be broken down as follows:

- a. Failure to ensure the Federal enforceability of all physical and operational limitations used in the PTE calculations;
- b. Failure to address the major source status (PTE) of the existing facility at which a modification is being proposed;
- c. Use of emissions factors that are not well-established or well-documented; and
- d. Failure to include quantifiable fugitive emissions where applicable.

For any one or more of these reasons, EPA considered the PTE determination in approximately 30 percent of the audited non-NSR/PSD source files to be deficient. More importantly, at least one-fifth of the files where EPA found deficiencies reportedly should have been reviewed as major sources.

In 36 agencies, EPA found permit files for which the agencies (a) did not properly ensure the Federal enforceability of all physical and operational limitations upon which emission estimates were calculated, or (b) did not adequately consider the potential emissions of existing facilities where a modification was being proposed.

EPA identified at least 28 permits where the agencies simply did not establish permit conditions defining the necessary limitations upon which the sources' estimated emissions were based. In other permits, some necessary limitations were either not addressed at all or were inadequately restricted. Sometimes the limitations were specified in operating permits which EPA generally does not regard as being Federally enforceable, but which are usually enforceable by State and local agencies.

It is also important to point out that some agencies consider the limitations to be enforceable if they are contained in the permit application. Apparently some agencies include a general condition in permits, which links the applicants' plans and specifications to the permits. It is not clear when and how often auditors took this into account when evaluating the Federal enforceability of the limitations.

In cases where a permit involved a modification to an existing source, EPA sometimes found that no determination of the existing source's PTE was made. While it is true that the existing source's PTE is irrelevant for the immediate applicability determination, when the proposed emission increases would not exceed prescribed significance levels, it is nevertheless important to know what the source's cumulative PTE is for consideration in subsequent modification proposals by that source. Files, in some cases, did not appear to contain any documentation of the existing source's PTE or of cumulative emissions for future reference.

Eleven (11) agencies issued 21 permits (6 percent of the audited non-NSR/PSD source files) that did not adequately address fugitive emissions. Reportedly, one source likely would have been required to undergo major source review if the quantifiable fugitive emissions had been included in the emission calculations. Twice as many non-NSR/PSD source files, i.e., 12 percent, did not provide sufficient documentation of the emission calculations, to enable EPA to verify whether fugitive emissions were properly considered.

Finally, in 24 separate agencies, EPA identified 40 non-NSR/PSD source permits (11 percent of the minor source permit files audited) where they concluded that well-established or well-documented emissions factors were not used to estimate source emissions. An additional 32 files did not provide enough information to allow a good understanding of how the emission estimates were calculated.

3. Does the agency use as its netting baseline actual emissions expressed in tons per year?

No specific problems involving the NSR/PSD permit files were found. Auditors did indicate, however, that insufficient documentation prevented an affirmative conclusion from being drawn in just a few cases.

With respect to the non-NSR/PSD files, EPA identified 20 agencies who either did not require the proper procedures to be used to calculate a net change in emissions, or did not provide enough information to enable the auditors to determine whether actual emissions were correctly calculated. In these agencies, EPA found at least 35 examples of specific procedural problems or documentation problems. The findings indicate that:

° Ten (10) agencies allowed proposed modifications to determine their net change in emissions on the basis of potential or allowable emissions rather than actual emissions. At least 5 of the agencies permitted new replacement units, of equal capacity to units being shut down, without considering the net change in actual emissions.

° Three (3) agencies did not properly determine actual emissions changes-- 2 failed to use a tons-per-year emission baseline, while 1 did not use emissions that were representative of normal source operation.

° Thirteen (13) agencies did not provide sufficient information in some files to enable the auditors to determine how the emission changes were calculated.

4. Does the agency check applications for proper use of contemporaneous emission changes to prevent the "double counting" of emission decreases for netting purposes?

No evidence of double counting was found in the audited permit files. Of some concern, however, is (1) the lack of documentation to verify that double counting has not occurred, and (2) the apparent failure to make the emission reduction credits Federally enforceable.

The lack of documentation was indicated in seven agencies as the reason why auditors could not verify that double counting had not occurred. But it should be noted that there were no suggestions that any problems were suspected.

EPA requirements stipulate that emission reductions must be made Federally enforceable. This was reportedly not done in single permits found in 10 agencies. In 7 of these agencies, emission reduction credits were not addressed at all in permit conditions, thus raising the question of whether the reductions are enforceable even by the affected agencies. Making the emission reductions enforceable conditions of the permit also helps to ensure that subsequent double counting of such emissions will not occur inadvertently.

5. Does the agency properly apply the §107 area designations when determining what type of preconstruction review will be required of major construction?

No clear examples of the misapplication of §107 area designations were identified. One agency apparently continues to provide for a "clean spot" exemption in its permit requirements for nonattainment areas. To date, however, this apparently has not resulted in any applicability determinations that are inconsistent with EPA requirements.

6. Verify that the agency does not approve major construction projects in designated nonattainment areas under an EPA-imposed construction moratorium.

The audit findings produced no problems of national significance. However, auditors questioned two minor source permits issued to sources locating in nonattainment areas where EPA had imposed construction bans. One source actually operated at levels below significant emissions rates, but was a major source in terms of its potential to emit. No corrective

action was recommended because the source had shut down. In the other case, the source was approved as a minor source apparently because an allowable (rather than actual) emission baseline was used for the netting calculations. A recommendation was made in this case to re-evaluate the permit.

E. BACT/LAER DETERMINATIONS

In this section, the audit examined several aspects of the BACT/LAER control technology requirements that are generally applicable to PSD sources and major new and modified sources in nonattainment areas. However, more weight was given to the BACT analysis for this year's audit. With respect to BACT, emphasis was put on whether agencies were requiring an adequate analysis of each regulated pollutant emitted in significant amounts. Prescribed significance thresholds applicable to each pollutant are defined by the PSD regulations.

In order to get a better idea of how thoroughly the BACT analyses are being carried out, additional questions were asked to determine whether the analyses routinely considered more than one possible control technology, and whether the agency routinely took it upon itself to verify the analyses submitted by the applicants.

The audit also sought to determine the extent to which the BACT/LAER requirements are functioning as technology-forcing requirements. This was accomplished by asking the auditors to determine the relative stringency of the BACT/LAER determination for each major source audited on the basis of applicable NSPS and NESHAP standards, which serve as the minimum control requirements legally allowed for BACT and LAER.

1. Does the BACT analysis consider each regulated pollutant emitted in significant amounts?

Of the 32 agencies issuing PSD permits, most appear to be complying with this PSD requirement. The auditors found exceptions, however, in a total of 8 PSD permits issued by 5 agencies. In only 2 agencies did the problem occur in more than one permit.

Some pollutants were not considered for BACT because of an apparent failure on the part of the audited agencies to address potential emissions, i.e., actual emissions were incorrectly used. It is presumed that in such instances when this practice is corrected, any pollutants calculated to be potentially emitted in significant amounts will be properly considered for BACT.

2. Does the review agency require consideration of more than one BACT control technology? If so, to what extent are economic, energy, and non-air environmental impacts considered?

Last year's audit indicated that most agencies appear to require PSD applicants to analyze more than one control technique as part of their BACT selection process. Some agencies noted, however, that this requirement was not always implemented if a particular control technique was regarded as "obvious" or common for a particular source. A few agencies claimed that a preapplication meeting with the applicant was used to determine BACT;

therefore, an analysis of alternatives did not need to be contained in the PSD application.

This year's audit findings generally support the agencies' claims in that most (84 percent) of the audited PSD files did address, to some degree, consideration of alternative control techniques. However, the overall quality of the BACT analyses was questioned in a significant number of cases. Specifically, auditors found that:

- ° Fifty-three (53) percent of the agencies where PSD permit files were examined had files in which control alternatives were routinely considered;
- ° Thirty-one (31) percent had some files which addressed alternatives while other files did not; and
- ° Sixteen (16) percent of the agencies had no PSD files which addressed alternative controls for BACT.
- ° One-third of the PSD permit files where control alternatives for BACT were considered failed to adequately address the impacts of each alternative in order to demonstrate the rationale for selection of a particular control technique.

Eighteen (18) PSD permits (approximately 30 percent of the PSD permits audited), issued by 13 agencies, did not address alternative controls at all. Yet, it could not be determined in every case that the control technique used to define BACT was always the most "obvious" choice. Auditors noted that in some cases the applicant claimed the best control(s) had been selected, but this was rarely confirmed by the auditor. In some cases, auditors noted that only NSPS were considered. Thus, it would appear that the omission of other control techniques from consideration may not always be acceptable. EPA intends to examine this in greater detail in future audits.

Finally, where agencies claim to conduct a preapplication meeting with the applicant in order to review candidate control options in advance, EPA recommends that each meeting should be carefully documented to include a description of the alternatives considered and the basis for them being eliminated. Agencies should retain this documentation in the appropriate PSD files as a formal record of the BACT selection process.

3. What checks does the review agency employ to confirm the applicant's BACT analysis?

Auditors were asked to determine whether each audited PSD file contained sufficient documentation to show that the reviewing agency had verified the applicant's calculations and assumptions for BACT. Auditors did not respond to the question in a few cases, but the overall findings show that:

- ° Sixty (60) percent of the agencies consistently verified the applicants' BACT analysis;
- ° Sixteen (16) percent were inconsistent in that some files demonstrated the agencies' verification efforts while other files did not; and

° Nineteen (19) percent provided no evidence in their files that they had verified the BACT analyses submitted by the applicant.

Auditors found no apparent agency verification of the applicants' BACT analyses in 18 PSD permit files. This finding was mixed between situations where only one control technology was considered and others where several alternatives were considered by the applicant. The auditors concluded in some cases that little independent analysis was likely to have occurred because of the questionable nature of the BACT selections. In other instances, however, it appeared to be more a question of whether the agencies had failed to adequately document their own analyses.

4. What tendency is there for the agencies' BACT/LAER determinations to conform exactly to the minimum requirements, i.e., NSPS or NESHAP standards where applicable?

For this question, applicable PSD files were examined for the application of BACT and files for major nonattainment area sources were examined for LAER. The findings are based on 39 PSD files from 24 agencies and 9 major nonattainment area source files from 8 agencies. Only sources for which NSPS standards applied were considered.

a. BACT

There is a strong overall tendency for agencies to accept the use of the applicable NSPS to define BACT for PSD sources. Even though examples of BACT determinations more stringent than NSPS were found in 12 of 24 affected agencies, BACT was defined as the applicable NSPS for approximately 80 percent of the pollutant determinations which agencies made for PSD sources subject to NSPS.

The audit findings show that:

° Twelve (12) agencies accepted the applicable NSPS for all BACT determinations. These agencies issued 18 permits for which 32 pollutant determinations were made.

° Seven (7) agencies defined BACT more stringently than the applicable NSPS for at least 1 pollutant but typically accepted NSPS for most pollutant determinations. In the 15 permits that these agencies issued, BACT was set at levels more stringent than NSPS for 9 pollutants, while NSPS was applied to 34 pollutant determinations.

° Five (5) agencies defined BACT more stringently than the applicable NSPS for all of their BACT determinations. These agencies issued 6 PSD permits for which 9 pollutants were controlled beyond NSPS.

° Of 39 PSD sources subject to NSPS, 25 were allowed to use NSPS for all affected pollutants, while 8 were required to meet control requirements more stringent than BACT for all affected pollutants.

b. LAER

As might be expected, agencies showed a significantly greater tendency to define LAER beyond the applicable NSPS than was the case for BACT determinations. For the 9 permits issued, LAER was defined to be more stringent than NSPS for 6 pollutants, while the control of 5 pollutants was set equal to NSPS.

Three (3) agencies allowed 4 sources to meet the applicable NSPS to satisfy the LAER requirement for a single pollutant in each case. The other 4 agencies required LAER to be set at levels more stringent than NSPS for 5 sources for all but 1 pollutant.

F. AMBIENT MONITORING (PSD)

This portion of the audit examined the PSD requirement which provides that PSD sources must collect air quality data and submit it as part of their application for a construction permit. The PSD regulations contain, for each pollutant, specific de minimis ambient concentrations that are to be used to determine when a PSD applicant does or does not need to gather ambient air quality data. For those pollutants for which ambient data must ultimately be reported, EPA guidelines set forth procedures whereby a source must either (1) establish and operate an ambient monitoring network and collect data for 12 months or less, or (2) analyze existing ambient data which is "representative" (in accordance with specific EPA criteria) of the air quality in the impact area of the proposed source.

1. Under what circumstances is a source required to submit preconstruction ambient monitoring data?

The auditors examined PSD files to determine whether agencies had followed the correct procedures for requiring applicants to submit ambient air quality data, either from source-operated monitors or from existing representative data. Thirty-four (34) sources were required to submit ambient data. Another 20 sources were correctly exempted in accordance with the criteria for de minimis situations, but 5 did not address the data requirements.

Because of inadequate documentation, auditors were unable to ascertain whether the exemption of 5 sources, allowed by 4 agencies, had been handled properly. For at least 2 of the exemptions, made by 1 agency, the auditors believed that the sources' impacts were de minimis and ambient data would not be needed. For one, however, the auditor believed that the source should have been required to submit air quality data.

In the 20 agencies requiring that the data requirements be addressed, most applicants were allowed to use existing air quality data rather than having to establish a monitoring network to collect new data. The findings indicated that:

° 30 sources were allowed to use only existing data for a total of 55 pollutants; and

° 4 sources (involving 4 separate agencies) were required to monitor a total of 7 pollutants (but agencies allowed 2 of the sources to use representative data for 1 pollutant each).

2. Under what circumstances may a source submit existing data, rather than conduct new monitoring?

Where PSD sources were allowed to use existing data to meet the air quality data requirement, auditors examined the files to determine whether agencies followed Federal criteria to ascertain that the existing data was representative of the area of source impact. The air quality data was checked for adequate consideration of the location of existing monitors, as well as the quality and currentness of the existing data.

Seven (7) files from 5 agencies (1 agency had 3 affected files) offered no documented basis for allowing the use of existing data. Seven (7) other files involving 6 agencies (including 2 of the 5 already mentioned) contained some description of the data used but failed to adequately consider or meet all of the criteria for representative data.

For the 32 PSD sources allowed to use existing data for at least 1 pollutant, auditor responses given to the Federal criteria for representative data are as follows:

	<u>YES</u>	<u>NO</u>	<u>CBD</u>
a. Adequate consideration of monitoring site location	61%	16%	23%
b. Adequate consideration of data's quality	61%	10%	29%
c. Adequate consideration of data's currentness	63%	10%	26%

3. Do the source monitoring data adhere to PSD quality assurance requirements?

In the 4 agencies requiring source monitoring, EPA auditors checked the 4 PSD files and found that only 1 file contained a monitoring plan. This file contained, among other things, the applicant's quality assurance procedures that would be followed for the duration of the monitoring effort. One auditor indicated that a monitoring plan had been submitted for one source but the plan was not in the permit file. The remaining 2 files did not provide any evidence that a monitoring plan had been submitted.

In all 4 cases, applicants conducted the monitoring for 12 months as generally required by the PSD regulations.

G. AMBIENT AIR QUALITY ANALYSIS

For this section, auditors were asked to examine three main areas of concern. The first--PSD increment analysis--looked at how well agencies evaluated PSD permit applications to determine the amount of PSD increment that would be consumed by the proposed source or modification. Auditors focused on whether the increment analyses (1) addressed the appropriate emission changes which affect available increments, (2) considered both long- and short-term increment averaging periods, and (3) gave adequate attention to Class I area increments.

The second area of concern pertains to agency procedures for providing adequate NAAQS protection. Auditors were asked to determine, for all major and minor source permits, whether and to what extent each source underwent an analysis to ensure that the national standards (NAAQS) would not be violated.

Finally, the auditors evaluated the adequacy of the agencies' models and modeling procedures. Agencies are expected to use models which have been approved for use by EPA, but also of importance is that the appropriate model (and model options) is selected for a particular set of modeling conditions.

PSD Increment Analysis

The audit findings indicate that 29 agencies required PSD applicants to perform increment analyses. In these agencies, 46 PSD permits included analyses of either the TSP or SO₂ increments, or both. These analyses totaled 43 for SO₂ and 31 for TSP. Auditors did not find any PSD files for which an increment analysis should have been done but was not.

1. Does the agency consider the baseline concentration and emission changes which affect increment consumption?

Seventeen (17) agencies were affected by the auditors' findings that existing major and minor source emissions are not always being adequately addressed as part of the required increment analysis. In a few cases, it was apparent that no emissions other than those emissions resulting from the proposed PSD source were being addressed. Occasionally, only emissions from other PSD sources were included in the analysis. The key findings show that:

- Approximately 33 percent of the PSD applicants required to analyze PSD increment consumption failed to adequately address existing major and minor source emissions which contribute to the amount of increment consumed.

- Approximately 15 percent of the files did not provide enough information to enable the auditors to evaluate the increment analysis that was done.

- Minor source growth was not adequately addressed in 30 percent of the SO₂ analyses and 20 percent of the TSP analyses.

- Existing emissions from major sources were inadequately addressed in 10 percent of the analyses for SO₂ and TSP.

2. Are both long- and short-term PSD increments being given adequate consideration as part of the increment assessment?

The audit findings indicate that agencies adequately consider both the long- and short-term increments for SO₂ and TSP. In only one case did an agency fail to adequately address both averaging periods. The auditor's remarks indicated that this was a unique circumstance which was not indicative of the affected agency's typical performance.

It is interesting to note that agencies tended to be conservative in their use of modeling results to determine the amount of increment consumed. Whereas EPA recommends using the highest of the second highest receptor site concentrations, agencies used the highest concentration in 65 percent of the TSP analysis and 51 percent of the SO₂ analyses.

3. Does the agency make an adequate assessment of the new sources and modifications affecting the Class I increments?

None of the 16 PSD permits for which a Class I increment analysis was required revealed any specific problems related to special Class I area considerations. Seven (7) of the permits were included among those found to be deficient in the consideration of other emissions changes contributing to increment consumption. It could not be determined whether and to what degree emissions not addressed by the applicants may have affected the analysis of Class I increments as opposed to Class II increments also analyzed for those permits.

In two cases, auditors made general comments indicating that 2 agencies needed to provide better protection of Class I areas within their own jurisdictions. No specific deficiency was identified in either case, however.

NAAQS Protection

1. Does the agency routinely evaluate the ambient impact of minor source construction?

This year's audit information supports last year's finding that most agencies do not routinely evaluate minor source construction for air quality effects. Less than 25 percent (81) of the audited minor source files were required to undergo a NAAQS analysis. Most agencies did, however, appear to scrutinize minor source applications individually to determine whether an ambient impact analysis should be done. But some agencies appear to provide little, if any, review of the ambient effects of minor sources.

Specifically, the audit results indicate that:

- Twenty-six (26) agencies did not require NAAQS analyses for any audited non-NSR/PSD source permits. In 5 of these agencies, auditors found sources which they believed should have undergone analysis but did not.

- Eighteen (18) agencies were found to have issued permits to non-NSR/PSD sources which, in the auditors' judgment, probably should have been subjected to an ambient impact analysis but were not. EPA identified a total of 40 permits for which this omission occurred. Forty (40) percent of these permits were issued by only 3 agencies.

- Overall, approximately 10 percent of the audited non-NSR/PSD source permits which did not consider ambient effects probably should have because of the sources' potentially significant air quality impacts.

- In 23 percent of the questionnaires, auditors did not respond when asked whether a NAAQS analysis should have been done, but was not. This may suggest that information in the files was insufficient to determine the need for a NAAQS analysis.

The auditors also examined the NSR/PSD permit files to determine whether and how well the NAAQS analyses were performed for major sources. The findings show that most NSR/PSD sources underwent NAAQS analyses where appropriate; 61 files (80 percent of the files audited) included a NAAQS analysis. The findings also indicate that:

- Auditors did not identify any NSR/PSD permits for which a NAAQS analysis was completely omitted but, in the auditors' judgment, should have been required.

- Five (5) agencies, each having a PSD file that included a NAAQS analysis, should have required additional analyses, either for omitted pollutants or for more comprehensive review of considered pollutants.

- Auditors did not indicate whether a NAAQS analysis was performed for 2 PSD permits involving criteria pollutants. Nor did the auditors indicate that a NAAQS analysis should have been performed. It is assumed that the auditor did not have sufficient information available to them to respond appropriately to the applicable questions.

2. Does the agency's ambient impact analysis provide adequate protection against the development of "hot spots"?

Adequate NAAQS protection requires that the reviewing agency give consideration to the interaction of proposed new emissions with emissions from sources already in existence (including sources which may have already received a permit to construct but are not yet operating) and to points of projected maximum ambient concentrations resulting from multi-source interactions rather than just points of maximum concentrations from the proposed source alone.

Auditors found that many agencies generally provide adequate NAAQS protection. Oftentimes, however, a lack of file documentation prevented the auditors from making a determination. The NSR/PSD source files tended to contain better documentation than did the non-NSR/PSD source files. The audit findings reveal the following:

- Thirty-four (34) percent of the audited agencies were judged to provide good or acceptable protection of the NAAQS most, if not all, of the time.

- Twenty-two (22) percent of the agencies had files which typically suffered from insufficient documentation. In these cases, auditors could not determine whether and to what degree source interactions had been considered in the NAAQS analysis.

- Thirteen (13) percent of the agencies were found to be inconsistent in that some analyses adequately considered source interactions but others did not.

- Nine (9) percent of the agencies typically omitted significant emissions from other sources in the vicinity of the proposed source.

° Almost 60 percent of the non-NSR/PSD source permits reviewed for NAAQS protection failed to include sufficient documentation to determine the adequacy of the ambient impact analysis. Fifteen (15) percent were judged inadequate in terms of considering multi-source interactions.

° For NSR/PSD permits, 32 percent of the files reviewed for NAAQS protection had insufficient file documentation. Thirteen (13) percent were judged to have inadequate analyses for full NAAQS protection.

Dispersion Models

1. Does the Agency use adequate models to carry out the ambient impact analysis?

EPA examined the modeling techniques used or accepted by agencies to analyze PSD increment consumption and potential source impact on the NAAQS. The audit results indicate that agencies generally used or required applicants to use the appropriate models and model options. However, the lack of sufficient documentation to fully describe the rationale for the use of particular models and the methods used was a hinderance to the auditors in many instances.

Specifically, the audit findings show that:

° Five (5) agencies used or allowed the use of inappropriate models for the ambient impact analyses contained in 8 permit files. In only 2 of the agencies did the problem occur more than once.

° The use of inappropriate models was identified in 2 PSD increment analyses and in 6 NAAQS analyses involving the review of minor sources. In at least half of these situations, the models used were inappropriate for the existing terrain features.

° Permits found in 34 agencies (almost 70 percent of the agencies where ambient impact analyses were included in the files) did not contain sufficient information to support the use of the models and model options used. However, in over 40 percent of these situations, auditors concluded that the appropriate modeling techniques had been applied.

2. Does the agency perform an independent, internal review of the modeling analyses contained in the permit application?

Most agencies were found to adequately review the applicants' modeling analyses; but inadequate reviews were identified in 8 agencies for a total of 10 permit files. Seven (7) of these files pertained to non-NSR/PSD source permits; the other 3 were for PSD sources. In only 1 agency did the finding relate to more than 1 file.

Apparently, most agencies do not often require non-NSR/PSD source applicants to perform the modeling analyses. Eighty (80) percent of the time, the source analyses were performed by the agencies themselves. According to the responses provided by auditors, the applicants were required to submit a modeling analysis for only 15 of the files that were examined. Thus, the audit results show that in about half those situations the analyses were not adequately checked by the agency responsible for the permit review.

H. EMISSION OFFSET REQUIREMENTS

When a major new or modified source is allowed to construct in an area designated as nonattainment, emission reductions are generally required to offset the new emissions. These emission reductions or offsets must meet specific criteria set forth under Part D of the Clean Air Act in order for the offsets to be creditable. Auditors examined selected files involving sources subject to the emission offset requirements to determine whether they met such criteria as described below.

EPA examined, in 13 agencies, 19 major source permit files involving construction in nonattainment areas. Of these 19 files, 1 permit was denied, and 2 were issued under policies which excluded the applicants from having to obtain emission offsets. The remaining files involved sources that should have obtained offsets, although some apparently did not.

With regard to the examples where offsets were not obtained, the audit results indicated that:

- One agency allowed a source (resource recovery facility) to postpone the acquisition of offsets because none were available at the time. This action complied with the agency's rules as contained in its Federally-approved SIP, but the SIP does not meet the current requirements based on Part D of the Clean Air Act.

- Two agencies should have required emission offsets, but apparently failed to do so. The auditors could not explain why 2 permits failed to address emission offsets for several nonattainment pollutants.

In examining the emission offsets on the basis of the specific criteria with which they must comply, EPA found only a few examples of areas where agencies experienced specific problems. EPA identified no examples of emission offsets that were not Federally enforceable. Similarly, agencies typically required offsets to occur on or before the time of new source operation (with the exception of the one case where offsets were allowed to be postponed) and to be expressed in the same manner, i.e., actual or allowable emissions, as for the demonstration of RFP.

Some problems did surface in that:

- EPA auditors had difficulty determining whether offsets were not otherwise needed to demonstrate attainment or RFP. Agencies often did not provide documentation ensuring that this criteria had been met, even though they may have actually done so.

- Four (4) agencies did not provide sufficient information in their files to enable EPA to conduct an adequate evaluation of the full creditability of the emission offsets.

- Three (3) agencies did not account for area and minor source growth that had occurred since the last permit. These emissions are to be offset along with the new emissions from the proposed source or modification.

I. PERMIT SPECIFICITY AND CLARITY

This final section of the new source review audit provides the results of EPA's examination of information contained in the permits issued to new and modified sources. Specifically, auditors were asked to examine how, and whether, permit conditions defining limitations applicable to the approved source or modifications are being established. Such limitations typically become the enforceable measures by which a source's construction and operation is regulated, and the means by which ongoing compliance is determined.

1. Does the agency adequately state or reference allowable emissions rates in each permit?

EPA identified 12 agencies that did not routinely state or reference each source's allowable emissions in the permits. The omission appeared to be a common occurrence, at least for non-NSR/PSD permits, in 8 of these programs.

An analysis of the individual permit file questionnaires shows that approximately 30 percent of the non-PSD/NSR construction permits in the audit data base did not specify the allowable limits. This finding must be qualified, however, because of the ambiguity of the instructions provided to the auditors by the questionnaire. Those instructions easily could have been interpreted by auditors as asking them to provide only the number of emissions limits actually specified in the permits, and not cases where a reference was made to a regulation containing the required limit. It is not clear how many of the responses took referenced limits into account (as was intended), but it is known that some did not.

The same qualification must be given for the results pertaining to NSR/PSD permits as well, although the ambiguity did not appear to have much effect on the findings. There were no permits for which auditors specifically said no limits were found, but auditors did not respond to the question in 5 cases.

Where limits were specified in the permits, auditors were asked to evaluate them in terms of their clarity, consistent with measurement techniques, and Federal enforceability. In most cases, the permits contained more than one emission limit. Where at least one of the limits was determined to be inadequate with respect to any of the variables considered, that file was rated inadequate as a whole. The percentages, as shown below, are based on the total number of permits which contained emission limits.

	<u>PSD/NSR Permits</u>			<u>Non-PSD/NSR</u>		
	<u>YES</u>	<u>NO</u>	<u>CBD</u>	<u>YES</u>	<u>NO</u>	<u>CBD</u>
a. Clear and precise averaging periods	75%	18%	7%	76%	18%	6%
b. Emissions rates consistent with acceptable measurement techniques	78%	11%	11%	72%	17%	11%
c. Federally enforceable	88%	6%	11%	78%	12%	10%

2. Does the agency identify all emission units and their allowable emissions in the permits?

Auditors reported that at least 15 agencies did not routinely identify each emission unit along with its allowable emission limit in the permits. The responses indicated that over half of the agencies "do not" or "generally do not" appropriately address each emissions unit. In two of these agencies, it was noted that the emissions units and the emission rates applicable to those units were identified primarily for PSD permits or where needed to avoid NSR/PSD review.

For the non-NSR/PSD permit files audited, EPA found 138 (38 percent) permits that did not address each unit and its allowable emissions. It would appear that in some cases emissions were "bubbled" under a single or composite emission limitation. This would make it difficult to enforce the limit with respect to the emissions coming from any particular unit. Agencies are advised to avoid any such practice because of the questionable enforceability of such composite limits.

3. Are the compliance test methods stated or referenced in the terms and conditions of the permits?

Nineteen (19) agencies reportedly either did not at all or did not consistently state or reference compliance test methods in the permits. Where the practice is not followed consistently, it is not clear what criteria, if any, agencies use to determine whether such information is to be included in the permit. Compliance test methods are commonly defined in the State or local agencies' rules and regulations, and many agencies indicated in last year's audit that specific mention of the test methods in each permit is not required to enable the agency to use them for compliance determination purposes.

Of the 252 non-NSR/PSD permits which specified emission limits, 42 percent stated or referenced all or some compliance test methods; 33 percent did not. For the remaining permits, it could not be determined from the auditors' responses how compliance test methods were addressed.

Agencies appeared more consistent in stating or referencing the compliance test methods in NSR/PSD permits. Sixty-five (65) percent of the permits included stated or referenced compliance test requirements; only 12 percent did not. Again, auditors did not respond to the question in a significant number of cases.

V. COMPLIANCE ASSURANCE

EXECUTIVE SUMMARY

As was the case in last year's National Air Audit System (NAAS) effort, many States and locals showed one or more strong points characteristic of a successful air compliance program, such as high source compliance rates supported by high inspection frequency rates, performance of all required new source performance standards (NSPS) source tests, expeditious resolution of violators, and few long-term violators. These activities were adequately reflected and validated by the national Compliance Data System (CDS). Other States had source files that were, for the most part, well organized, up-to-date, and complete, reflecting a reasonable profile of each source.

A State-by-State analysis of compliance statistics shows that inspection rates for Class A1* State implementation plan (SIP) sources generally increased over those reported in last year's audit, although four States were still unacceptably low, with inspection rates of less than 60 percent. Compliance rates for Class A1 SIP sources remained roughly the same as last year. The NSPS national average for both inspection and compliance rates rose, even though some individual State rates declined slightly. The NSPS inspection rates for two States are still seriously deficient, with figures of 33 percent. Overall national emission standard for hazardous air pollutants (NESHAP) inspection rates remained steady while compliance rates fell slightly. Fourteen States still have NESHAP inspection rates at or below the 55 percent.

The compliance audits also revealed that several State and local agencies, to a varying extent, still have weaknesses in three areas vital to a strong and effective compliance program. First, some source files maintained by State and local agencies do not contain verifiable information reflecting a reasonable profile of each source. However, there has been some improvement since last year's audits in the condition of State files, where the percentage of those reviewed that reflected a reasonable profile of the sources increased from 58 percent to 72 percent. Second, some inspection reports still are of poor quality (no mention of operating or emission parameters or pollutants emitted). For some agencies, there was a noticeable improvement in the quality of inspection reports since the last review, but there remain significant deficiencies in this area. Third, some of the reviewed agencies' enforcement efforts are not always effective in reducing the number of long-term violators by expeditiously returning documented violators to compliance, although there was a slight drop in the percentage of reports that indicated sources were not being expeditiously returned to compliance (from 30 percent down to 26 percent).

*Class A1 includes sources with actual or potential controlled emissions greater than or equal to 100 tons per year.

Thus, while there are improvements in all of these critical areas, some States and locals need to heighten efforts on the aforementioned three areas to further strengthen their compliance programs.

A. INTRODUCTION

As in FY 1984, the compliance assurance element of the FY 1985 NAAS was designed to examine State and local programs which are responsible for the compliance of sources subject to requirements of SIP's and, where delegated, standards for new stationary sources (section 111) and national emission standards for hazardous air pollutants (section 112). Of the several hundred thousand regulated stationary sources in the nation, there are approximately 30,000 sources in these categories for which EPA and State/local agencies share a concern about compliance status and associated enforcement activities. Compliance activities focusing on these sources formed the primary basis on which each audit was conducted.

There are three major parts of the compliance assurance audit. The first is a pre-visit assessment of the State or local agency performed by examining source data reported to EPA by the agency. For FY 1985, this included an assessment of how the newly-implemented "timely and appropriate" guidance was working. The other parts of the element are reviewing selected State source files and conducting overview inspections.

In accordance with the NAAS guidance, the EPA Regional Offices were to conduct the pre-visit assessment by obtaining Compliance Data System (CDS) retrievals for FY 1984 on inspection frequency, compliance rates, and enforcement activity. The Regions were then to analyze the CDS data for source compliance status, progress in meeting inspection commitments, identification of long-term violators and associated compliance activity, adherence to "timely and appropriate" guidance, identification of long-term compliers and associated surveillance activity, and identification of operating NSPS sources without the required 180-day performance test. Finally, based on this CDS analysis, the Regions were to prepare a summary of each compliance program and send it to the State or local agency before the visit. The analysis could have taken the form of a questionnaire for the agency or could have been a statement of findings to be discussed for completeness and accuracy during the visit. The pre-visit assessment was also designed to help in identifying the source files to be reviewed during the on-site visit.

The next major part of each audit was the on-site visit. The visit centered on a discussion of the findings in the pre-visit assessment and on review of 15-20 source files. The files to be reviewed were to consist of a mixture of SIP, NSPS, and NESHAP sources. A file review checklist was developed to assure consistency in how the file reviews were implemented. The goals were to see if the files contained a reasonable profile of the source, contained written documentation to support the compliance status reported to EPA, and contained documentation to show that violators are expeditiously returned to compliance. The State and local audit reports were envisioned to include a discussion of both the pre-visit assessment and the status of the files.

The final component of the compliance audit was to be a program of overview inspections conducted by EPA of 2-3 percent of the sources in the CDS inventory (Class A SIP, NSPS, and NESHAP). The purpose was to verify the compliance status of a source as reported to EPA as well as review State or local agency inspection practices to see if there were areas where EPA could increase performance through technical assistance to the State and local agencies.

This report covers 65 State and local audits. (No report was received on the compliance program for Hawaii). Ten questions were developed as a guide in developing a summary of the findings in the State and local audit reports. These questions represent the key elements of the compliance portion of the audit, and provide a uniform basis to do a national assessment of the compliance and enforcement programs.

B. MAJOR FINDINGS AND CONCLUSIONS

As was the case in last year's NAAS effort, many States and locals showed one or more strong points characteristic of a successful air compliance program, such as high source compliance rates supported by high inspection frequency rates, performance of all required NSPS source tests, expeditious resolution of violators, and few long-term violators. These activities were adequately reflected and validated by the national CDS. Other States had source files that were, for the most part, well organized, up-to-date, and complete, reflecting a reasonable profile of each source.

A State-by-State analysis of compliance statistics shows that inspection rates for Class A1 SIP sources generally increased over those reported in last year's audit, although four States are still unacceptably low, with inspection rates of less than 60 percent. Compliance rates for Class A1 SIP sources remained roughly the same as last year. The NSPS national average for both inspection and compliance rates rose, even though some individual State rates declined slightly. The NSPS inspection rates for two States are still seriously deficient, with figures of 33 percent. Overall NESHAP inspection rates remained steady while compliance rates fell slightly. Fourteen States still have NESHAP inspection rates at or below 55 percent.

The compliance audits also revealed that several State and local agencies, to a varying extent, still have weaknesses in three areas vital to a strong and effective compliance program. First, some source files maintained by State and local agencies do not contain verifiable information reflecting a reasonable profile of each source. However, there has been some improvement since last year's audits in the condition of State files, where the percentage of those reviewed that reflected a reasonable profile of the sources increased from 58 percent to 72 percent. Second, some inspection reports still are of poor quality (no mention of operating or emission parameters or pollutants emitted). For some agencies, there was a noticeable improvement in the quality of inspection reports since

the last review, but there remain significant deficiencies in this area. Third, some of the reviewed agencies' enforcement efforts are not always effective in reducing the number of long-term violators by expeditiously returning documented violators to compliance, although there was a slight drop in the percentage of reports that indicated sources were not being expeditiously returned to compliance (from 30 percent down to 26 percent).**

Thus, while there are improvements in all of these critical areas, some States and locals need to heighten efforts on the aforementioned three areas to further strengthen their compliance programs.

The remainder of this report addresses in more detail these findings. It is organized by the three parts of the audit: pre-visit assessment, file review, and overview inspections. The aforementioned ten questions, which represent the key elements of this compliance audit, are discussed in each appropriate part.

C. PERIODIC REVIEW AND ASSESSMENT OF SOURCE DATA

To assess the adequacy of State and local compliance programs, the EPA Regional Offices continually review source compliance status and inspection information submitted by the audited agencies and reflected in CDS for the SIP, NSPS, and NESHAP programs. The attached Figures 1-8 provide a compliance snapshot of all reviewed State and local air compliance programs as of September 30, 1984 (the time used for the CDS information in the FY 1985 audits).

As shown in the four pie charts in Figures 1-4, the national compliance picture is very respectable. Compliance rates have improved since last year's audit for Class A1 SIP and NSPS sources and declined slightly for NESHAP sources. The bar charts in Figures 5-8 depict, for each aspect of the air program, the inspection range, compliance range, and number of long-term violators range for all State and local agencies audited. As shown, inspection rates for SIP, NSPS, and NESHAP sources range from 0 percent to 100 percent, with median figures between 67 percent and 89 percent (compared to 62 percent and 80 percent in last year's report). Compliance rates for SIP, NSPS, and NESHAP sources range from a low of 0 percent in one jurisdiction to a high of 100 percent in another, with median figures near 95 percent. The number of long-term violators (defined for this audit as two consecutive quarters or more) in each jurisdiction was largest for Class A SIP sources, ranging from a low of 0 in some agencies to a high of 124 in another, with a median figure of 6 sources per jurisdiction.

**"Long-term violators" means sources in violation for two continuous quarters or more.

The following question is the first one of the ten developed as a guide for summarizing the findings in the audit reports.

- (1) Based on the findings of the pre-visit program analysis, what was the Region's overall assessment of the condition of the air compliance program?

A review of the 65 audit reports shows that some form of pre-visit assessment was done by the Regions for all but three State and four local programs. Thirty-one of these reports contained an overall statement about the particular compliance program based on the CDS analysis:

- Ten (10) air programs were considered very good.
- Twenty-one (21) air programs were considered adequate (meeting most Clean Air Act requirements).
- None of the air programs were termed seriously deficient.

The remaining 27 audit reports (where a pre-visit assessment was done) made no definitive statement on the air program based on the CDS assessment, but positive comments were made in 17 of these reports, such as "inspection rates are very good" and "compliance rates are good to excellent." It was not possible to determine anything of substance relative to the pre-visit assessment from the remaining ten reports.

Careful study of the audit reports for the ten agencies with "very good" air compliance programs shows several elements contributing to the success of each compliance program. In general, these agencies:

- routinely complete nearly all the required inspections for SIP sources, and NSPS and NESHAP sources where delegated;
- have compliance levels for Class A SIP, NSPS, and NESHAP sources consistently above 90 percent with recent inspections to support this level;
- address, in a timely manner (and according to "timely and appropriate" guidelines), sources found to be in violation of applicable emission limits or permitting requirements resulting in few, if any, long-term violators (greater than 180 days).

It seems likely that other States have compliance programs as good as these ten but this was not readily discernible from the description of the programs in the audit reports.

- (2) What is the Region's overall assessment of how the newly-implemented "timely and appropriate" guidance is working in the State or local agency?

Twenty-nine audit reports indicated that the guidance is being followed and the program is working well, while five reports stated that the guidance was not being followed (meaning few, if any, violators were resolved according to the guidelines). Of the remaining reports, 20 had no conclusions on the "timely and appropriate" guidance because either: (1) agreements reflecting the guidance were not reached with the States until late FY 1984, preventing assessment until later in FY 1985 (11 reports), or (2) there were no violators subject to the guidance (9 reports). The other 11 reports did not discuss the guidance in any detail.

To summarize the CDS based pre-visit assessment, 48 (74 percent) of the 65 State and local compliance programs were found by the Regions to be either adequate or very good, and no programs were judged seriously deficient based on that assessment. It was not possible to assign an overall description of programs from the other 17 (26 percent) reports. This initial effort identified many good programs and pointed out other areas where the State and local agencies and EPA should continue to work together to improve compliance programs.

D. FILE REVIEW

(3) Did the source files reflect a reasonable profile of the sources?

All 65 audit reports contained file review information. Forty-seven (72 percent) of these indicated that the files reviewed reflected a reasonable profile of the source, which means they contained the following information: source compliance status based on recent inspection or source test; an identification of all air program regulations the source is subject to, and, within the inspection report, operating parameters, point sources, and pollutants emitted by the facility. Some common reasons cited in the 13 audit reports (20 percent) where the files were considered deficient were: inability to determine source compliance status from file contents, no indication of which air program regulations the source was subject to (SIP, NSPS, NESHAP), and missing inspection reports or poor quality inspection reports (no mention of operating or emission parameters, point sources, or pollutants emitted by facility). The remaining five reports (8 percent) did not contain a conclusive statement on this question.

(4) Did the files contain adequate written documentation to support the CDS compliance status?

Thirty-seven (57 percent) of the 65 audit reports indicated that files reviewed contained some written documentation of compliance status to support CDS. This represents a drop of 5 percent from last year's documentation rate of 62 percent. Twenty-six (40 percent) of the audit reports (up from 24 last year) either cited a lack of any compliance information in the files, or showed information in the files which conflicted with CDS. The other two reports did not contain sufficient information to answer this question.

To facilitate a more consistent evaluation on this point, a further explanation of "adequate written documentation" was agreed upon in April and will be included in the FY 1986/1987 NAAS guidelines. Since this elaboration on the adequacy of written documentation was only agreed upon at a meeting with State and local agency representatives in April, it was not consistently used in this year's evaluation. As a minimum, a file should contain: (a) documentation that the source was inspected and that the regulated emission points and pollutants were evaluated, and (b) a determination of the compliance status of the source and documentation of the basis for that determination. The compliance status in the file should agree with the compliance status shown in CDS.

- (5) Are violations documented and pursued by agencies to return a source to compliance expeditiously?

Forty (62 percent) of the 65 audit reports indicated that violations are documented and pursued to return a source to compliance expeditiously. Seventeen reports (26 percent) indicated that some sources were not being expeditiously returned to compliance, in some cases, leading to a number of long-term violators (greater than 180 days) or untimely, protracted enforcement actions. Eight reports (12 percent) lacked a definitive response to this question.

E. OVERVIEW INSPECTIONS

Thirteen of the 65 audit reports reviewed did not contain any information on overview inspections. Therefore, the following questions cover the remaining 52 reports:

- (6) How many inspections were performed?

The number of EPA overview inspections performed ranged from a low of 2 to a high of 48. The total number of inspections for all 52 reports was 725, which is acceptable compared to the 600 to 900 inspections projected for this effort (2-3 percent of the Class A SIP, NSPS, and NESHAP sources in CDS).

- (7) How were sources selected by the Region for the overview inspections?

By far, the most common criteria used by the Regions to select sources subject to overview inspections were some combination of source size (preference to Class A1), type of program (to ensure a representative sample of SIP, NSPS, NESHAP sources), location (primary attention to impact on nonattainment areas as well as geographic spread), source compliance history, and pollutants. Most of the differences between the Regions' selection approaches were found in the amount of relative emphasis placed on each criterion.

(8) What did inspections consist of?

Almost all of the overview inspections performed were a joint effort between EPA and the States. Most began with a review of State source files and progressed to an on-site visit to the source, with both EPA and State inspectors conducting separate evaluations of source compliance status, after which separate reports were written and compared. A summary of the 52 audit reports with answers to this question appears below:

Joint Inspections - State Lead	30	(406 inspections)
Joint Inspections - EPA Lead	11	(132 inspections)
Joint Inspections - Dual Lead	9	(148 inspections)
Independent EPA Inspections	2	(39 inspections)
TOTAL	52	(725 inspections)

(9) What was the purpose of the overview inspections (that is, to verify independently State reported compliance, to observe State inspections practices, or some combination of these)?

Forty-six (90 percent) of the 51 reports stated that the purpose was a combination of independently verifying State compliance and observing/critiquing State inspection procedures (including State inspector qualifications). Of the five other reports, four mentioned simple verification of compliance status as the only inspection goal, and one explicitly cited status of overview inspections to train State and local inspectors.

(10) What were the overall results of the overview inspection effort, including recommendations for resolution of any problems discovered during the effort?

Thirty-nine of the 45 responses to this question (87 percent) showed both the expertise of State inspectors and State reported compliance status to be adequate, which means the State inspectors were experienced enough to conduct a thorough inspection and determine the compliance status of a source. Six reports (13 percent) indicated that overview inspection results did not agree with the compliance status in the State files or CDS.

Regarding recommendations, five reports suggested that more training for State inspectors would improve the quality of inspections and result in more accurate inspection data being reported to EPA.

FIGURE 1

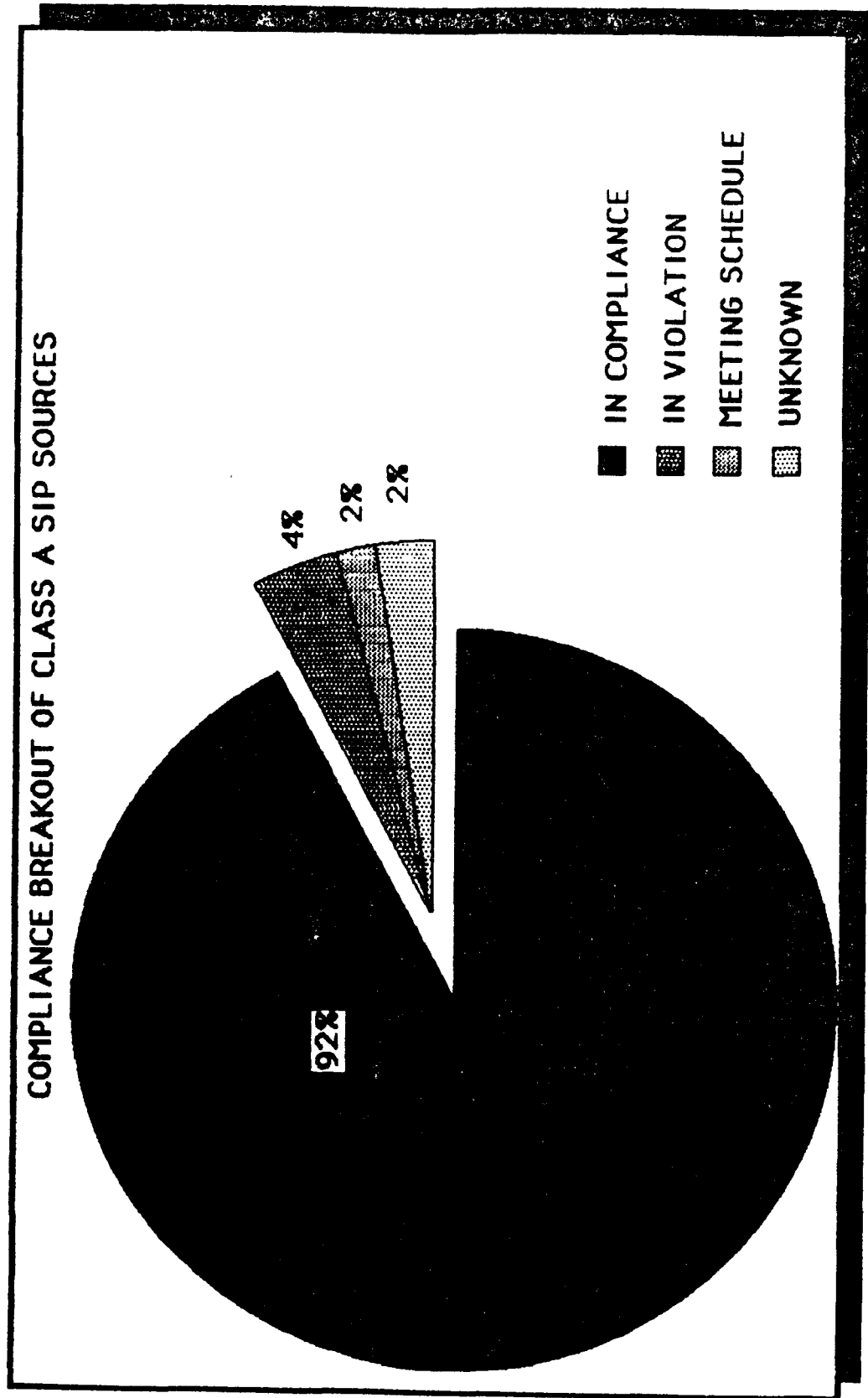


FIGURE 2

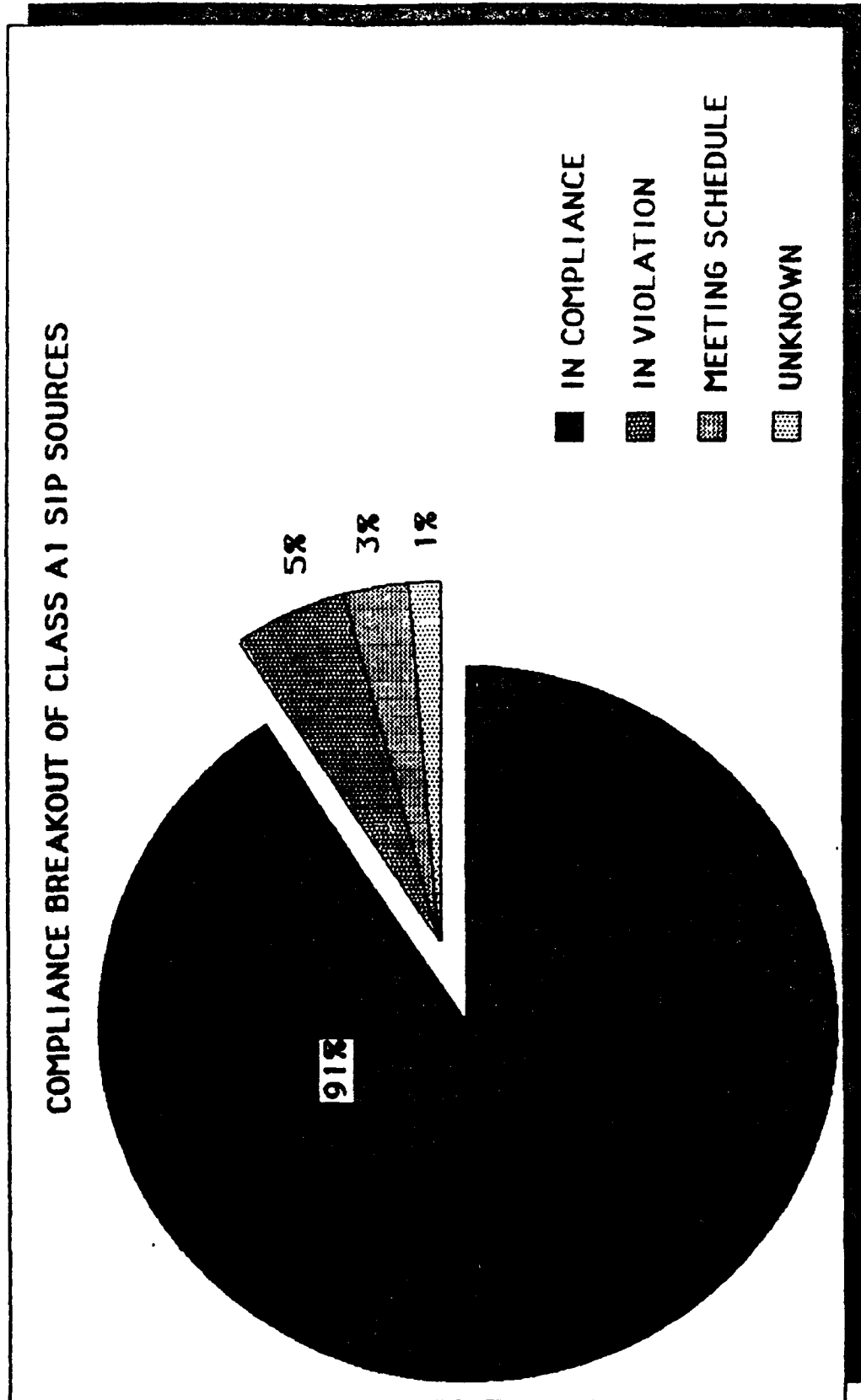


FIGURE 3

COMPLIANCE BREAKOUT OF NSPS SOURCES

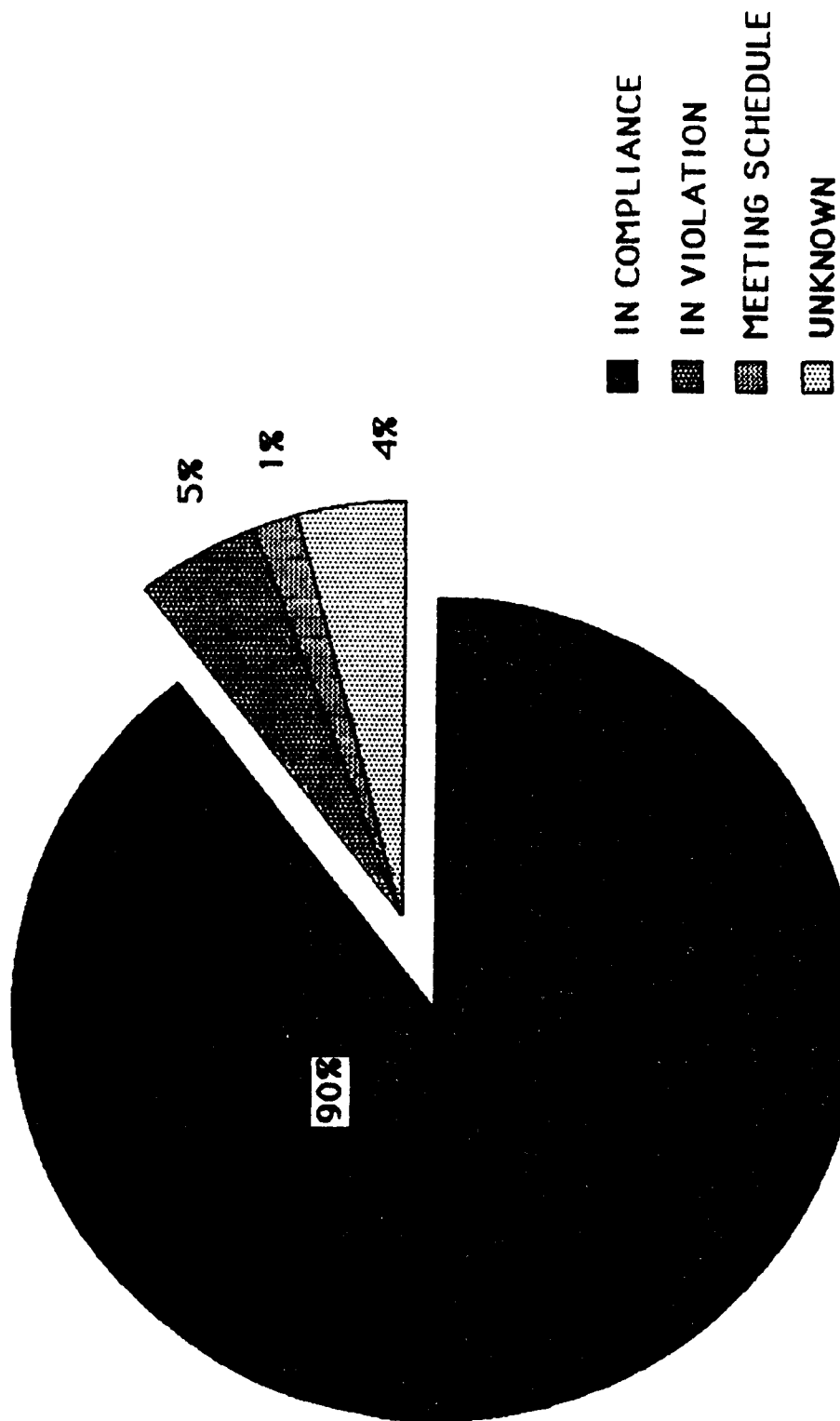


FIGURE 4

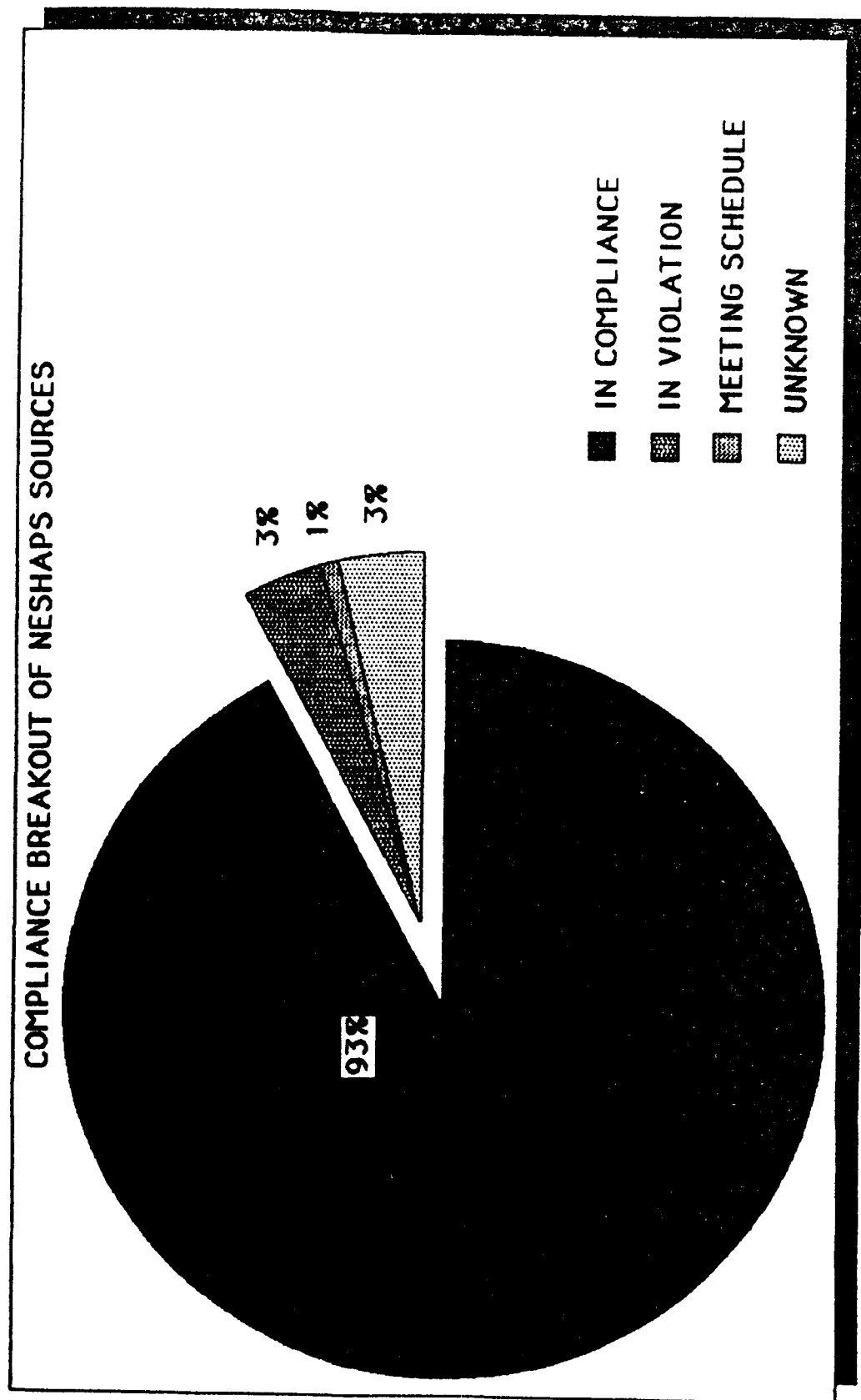


FIGURE 5

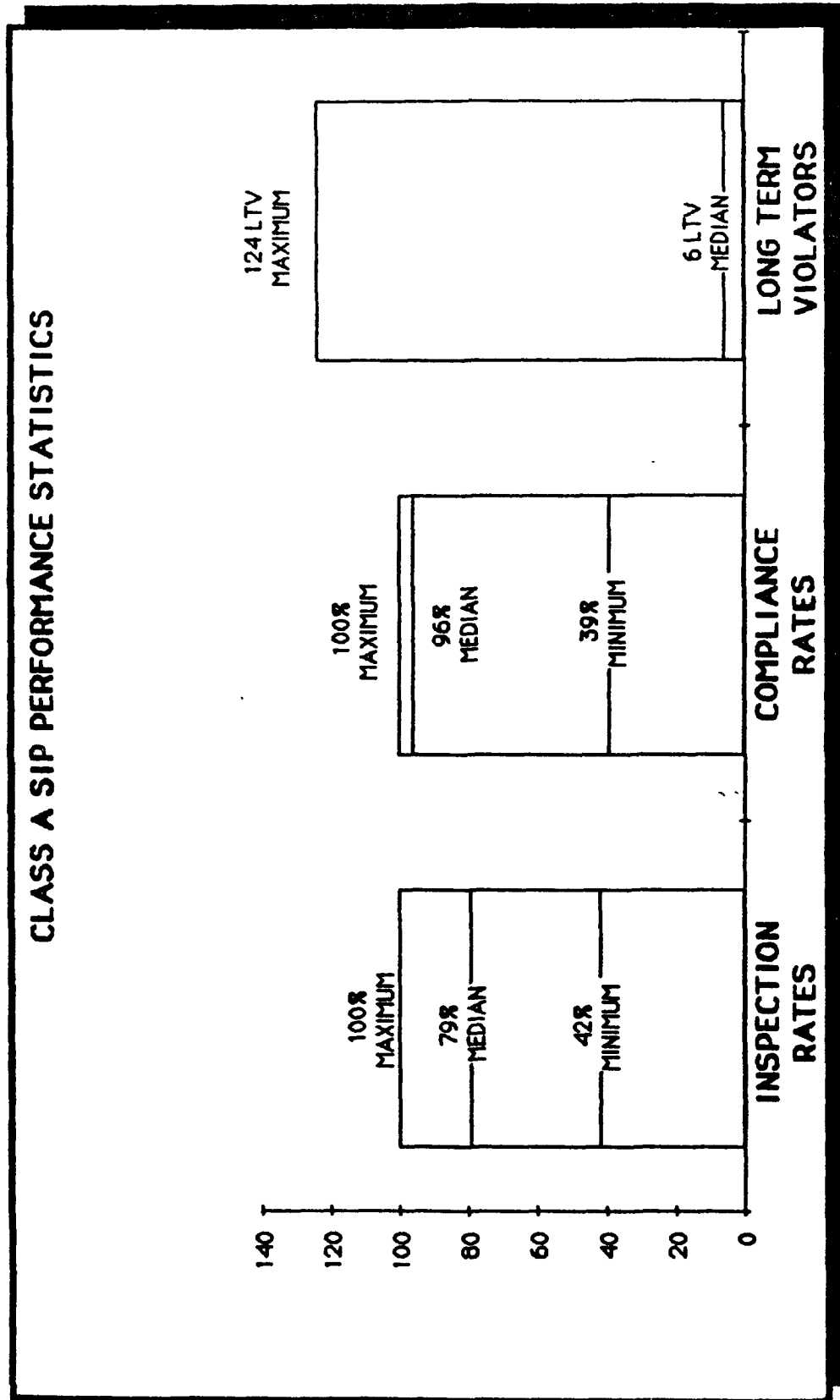


FIGURE 6

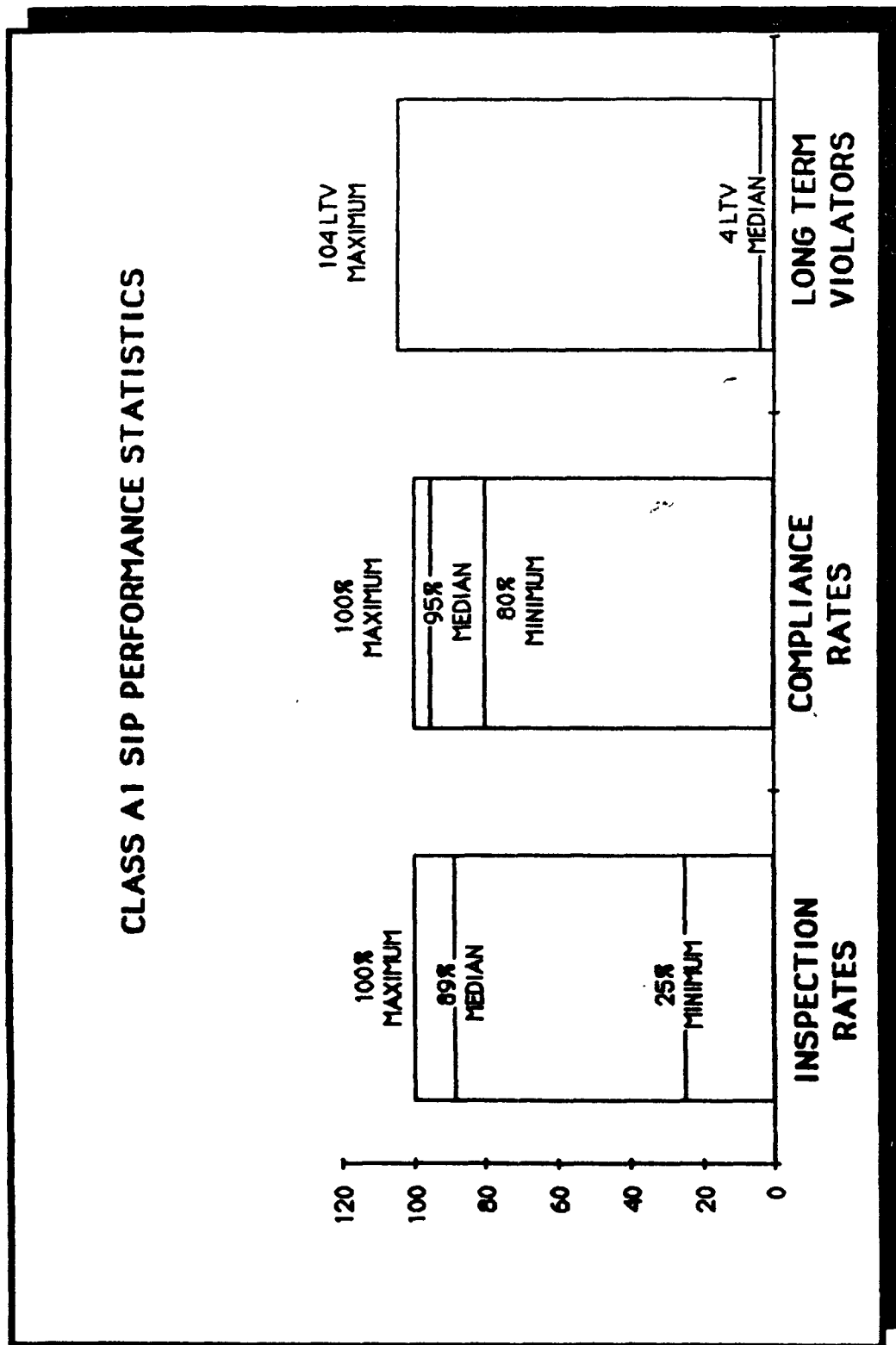


FIGURE 7

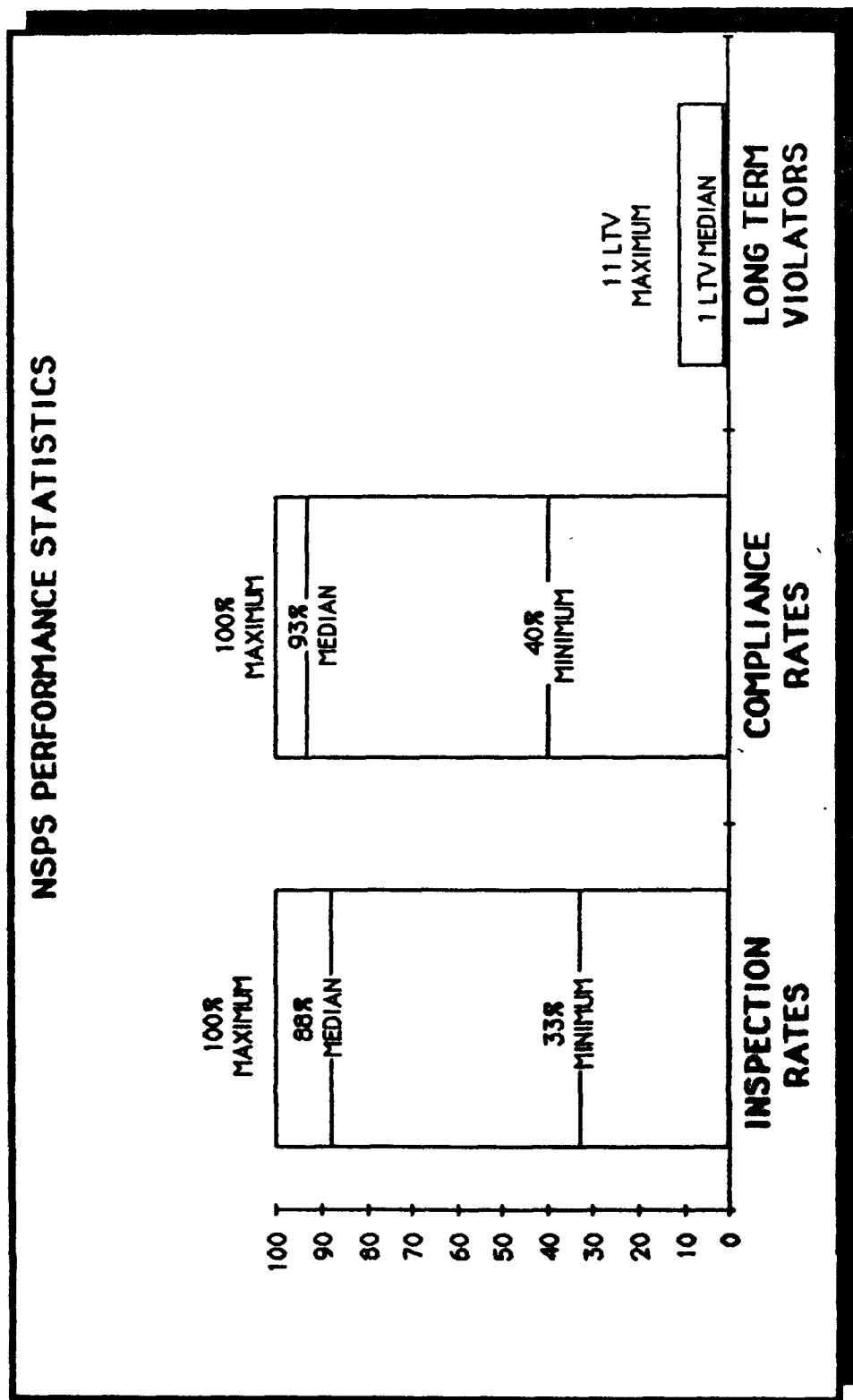
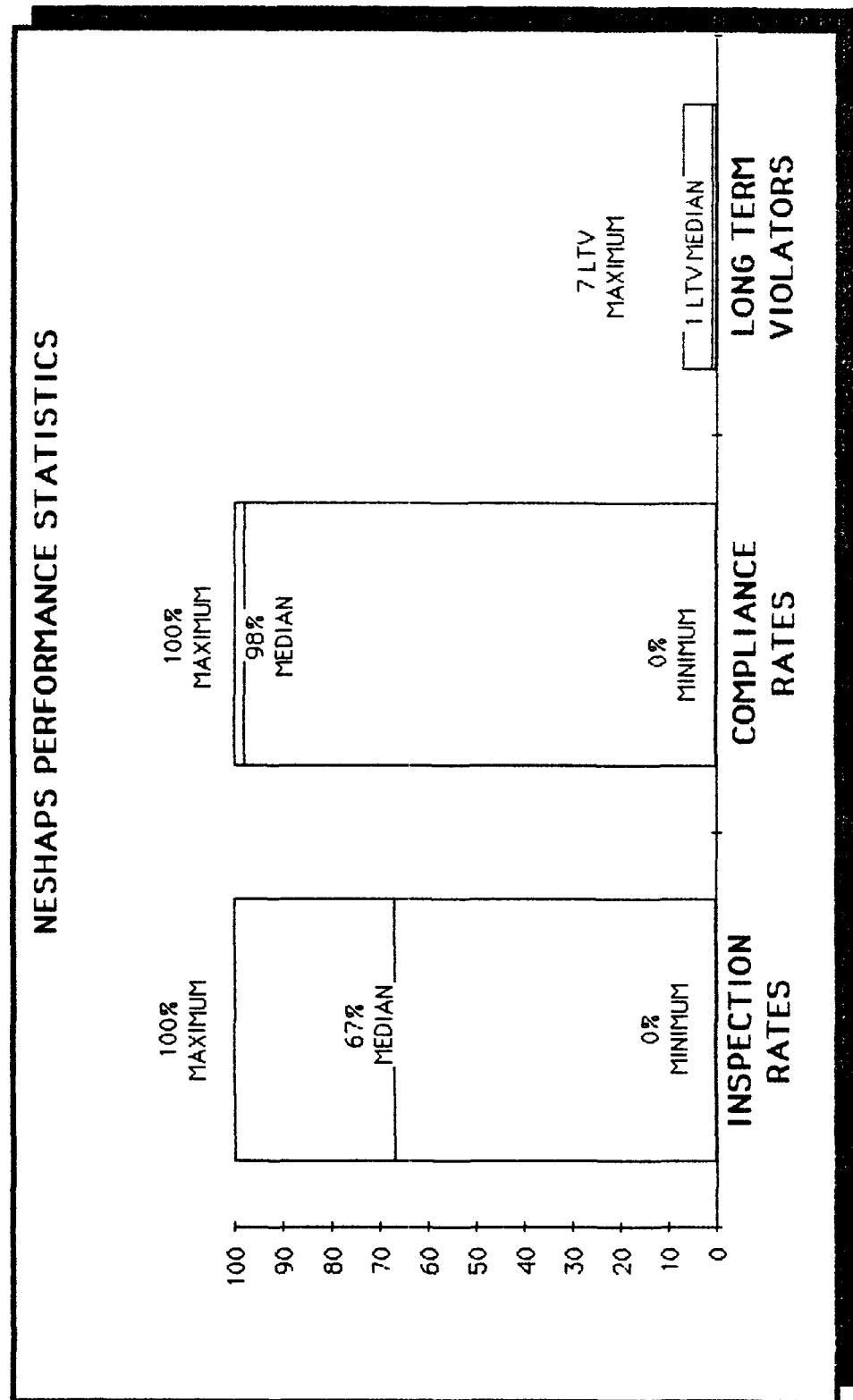


FIGURE 8



VI. AIR MONITORING

EXECUTIVE SUMMARY

The 1985 National Air Audit System included air monitoring audits of 73 agencies. Four principal areas within the agencies' air monitoring program were evaluated. These areas were network design and siting, resources and facilities, data and data management, and quality assurance/quality control. The principal conclusions relating to these areas are highlighted below.

The audit reports indicate that State and local agencies have continued their successful performance in operating and maintaining their State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS) networks. About 98 percent of the 4300 monitors operated by the audited agencies are meeting the monitoring regulations. No major or wide-spread siting problems with monitors were discovered.

The audit reports did disclose that 82 percent of the audited agencies reported needs for new or replacement of air monitoring or laboratory equipment totaling \$4.6 million. Of this total, \$3.6 million were needed for air monitoring equipment and \$1.0 million for laboratory equipment.

Similar to last year's audit, the 1985 audit indicated that timeliness of data submittal is still a problem for many agencies, particularly for submission of lead (Pb) data which are late about 25 percent of the time. In general, the data completeness percentage was good with a low of 84 percent for nitrogen dioxide (NO₂) and a high of 92 percent for total suspended particulate (TSP). Another problem area in the data management section of the audit was a deficiency by 24 percent of the agencies, in the submittal of the required annual SLAMS report. Corrective actions, however, are being taken to resolve this problem.

Quality assurance/quality control aspects of the audit reports indicate that most of the State and local agencies are doing a good job of maintaining adequate and up-to-date quality assurance plans. Four agencies need to substantially revise their plans and 46 had minor revisions pending. With respect to the achievement of quality assurance goals, for precision (± 15 percent for all pollutants) and accuracy (± 15 percent for TSP, ± 20 percent for other pollutants) data, the only significant problems are related to accuracy for NO₂ and precision for Pb. For NO₂, the percent of reporting organizations meeting the accuracy goal was 46. This same percent was indicated for Pb precision. The low values for NO₂ accuracy and Pb precision are believed to be related to the complexity of the NO₂ measurement method and the low ambient Pb levels.

A. INTRODUCTION

Ambient air monitoring for State implementation plan (SIP) purposes is required by section 110 of the Clean Air Act. Furthermore, section 319 of the Act requires the development and application of uniform air quality

monitoring criteria and methodology, reporting of a uniform air quality index in major urban areas, and the establishment of a national air monitoring system which uses uniform monitoring criteria. To comply with these requirements, the EPA promulgated ambient air monitoring regulations (40 CFR 58) in 1979, with further revisions in subsequent years. Included in the Part 58 regulations are requirements for the auditing of State and local air monitoring programs. These provisions have served as the basis for the national air monitoring audits which began in 1984. As a result of the findings and recommendations of the 1984 audits, several changes to the audit questionnaire were made in preparation for the 1985 air monitoring audits. The modifications made were not major in content. Instead, they were principally concerned with reorganization, clarity, and the reduction in requests for resubmission of data. The 1985 guidance did require, for national consistency, that all EPA Regional Offices use at least the short form questionnaire, the corrective action implementation request, and the system audit reporting format. Use of the long form questionnaire was left up to the discretion of the Regional Quality Assurance (QA) Coordinator with the concurrence of the State or local agency. The audit team in 1985 consisted of EPA Regional Office personnel and, in some cases, Headquarters representatives. The audits included interviews, on-site inspections, and the completion of the short or long form air monitoring questionnaire. The questionnaires contained questions covering the following four important topic areas: network design and siting; resources and facilities; data and data management; and quality assurance/quality control. Each of these areas and the associated questions are described in detail below following the discussion of "Major Findings and Conclusions."

B. MAJOR FINDINGS AND CONCLUSIONS

The air monitoring programs of 73 agencies (48 States, 22 locals, the District of Columbia, and 2 territories) were audited during 1985. The audit results indicate that State and local agencies continue to successfully operate and maintain their respective SLAMS/NAMS networks. About 98 percent of the 4300 monitors operated by the audited agencies are meeting the Part 58 monitoring requirements. These results are consistent with the periodic national SLAMS/NAMS status reports which show 97 percent of the 4723 monitors complying with the regulations.

Concerning the audit findings on resources and facilities, most agencies indicated that they had adequate space and personnel. However, the audit showed that 60 agencies or 82 percent did have air monitoring equipment needs. These needs include pollutant monitors, calibration systems, data processing equipment, and meteorological equipment. The projected cost to procure the monitoring equipment is approximately \$3.6 million. A need for major laboratory equipment to bring the laboratory support to adequate levels was expressed by 24 agencies. Total cost for this equipment is about \$1.0 million.

Similar to last year's audit results, timely data submittal continues to be a problem for many agencies. The problem is principally lead data submittals, which are late approximately 25 percent of the time. The percentage of late submittals for the other pollutants range from 8 to 14. This problem

has received greater attention by EPA and State and local agencies, and a tracking system has recently been instituted within the EPA's Monitoring and Data Analysis Division to monitor the progress being made in timely data submittals. With respect to meeting the National Air Data Bank (NADB) 75 percent data completeness criteria, in general, the results were good. The audit showed a range of 8 percent, with a low of 84 percent for NO₂ and 92 percent for TSP. One of the larger problem areas found in the data management section of the audit was the requirement for submitting the annual SLAMS report. The audit showed that of the 51 audited agencies required to submit an annual SLAMS report, 12 agencies or 24 percent were deficient in one or more of the 4 required elements of the annual report. This problem should be easily resolved administratively and efforts are underway to correct it.

The QA aspects of the audit reports indicated that 69 of the 73 agencies had QA plans that were, in general, acceptable. However, 4 agencies need to substantially revise their plans and 46 had minor revisions to their QA plans pending. Seventy-two of the 73 agencies were participants in the National Performance Audit Program, an excellent rate of involvement. The last phase of the quality assurance program evaluation was the assessment of achievement of the precision and accuracy goals (precision, ± 15 percent for all pollutants; accuracy, ± 15 percent for TSP, ± 20 percent for other pollutants) by the agencies' reporting organizations. The lowest rate for achievement of the precision goals (based on one quarter of data) was for Pb, with only 46 percent of the organizations meeting the ± 15 percent goal. Based on data submitted to the Environmental Monitoring and Support Laboratory (EMSL) for the 1984 annual precision and accuracy report, 65 percent of the reporting organizations met the Pb precision goal. This difference of 19 percent is thought to be principally due to the difference between the time periods used.

The lowest percent of reporting organizations meeting the accuracy goals was 46 which was for NO₂. The 1984 accuracy achievement level for NO₂ based on the annual data submitted to EMSL was considerably higher, reaching 70 percent. The other pollutants compare fairly well between the two data sets. The reasons for the lower values for NO₂ accuracy and Pb precision are believed to be related to the complexity of the NO₂ measurement method and its associated audit methods and the relatively low ambient levels for lead. It is also possible that the wide confidence intervals (CI's) associated with NO₂ accuracy estimates are related to the fact that, for most reporting organizations, there are actually few NO₂ sites relative to site counts for the other parameters. In a statistical sense, the presence of even a few relatively large, but still "acceptable," individual audit differences are magnified into large quarterly CI's due to the small number of points actually comprising the statistic.

C. NETWORK DESIGN AND SITING

The network design and siting section of the audit was aimed at assessing compliance of air monitoring programs with the requirements of Appendices D and E of 40 CFR Part 58. To assess this topic, five overall aspects were reviewed. They were as follows:

- ° Network size and written description of the network
- ° Network modification during the last year
- ° Sites not meeting network design or siting requirements
- ° Performance of the annual network review requirements
- ° Survey of noncriteria pollutants monitored by agency

Responses to this section of the audit were intended to serve as a cross-check and update of existing EPA data on the number of monitors, their distribution, their conformance with siting requirements, and compliance with the annual network review provisions. This section also provides an enhanced perspective on network stability and the variety of noncriteria pollutants monitored by State and local agencies. In reviewing the audits, there appeared to be general agreement between State and local agencies in terms of completeness of response or compliance with requirements of the regulations.

The number of sites operated by the 73 agencies audited was 1290 NAMS, 3019 SLAMS, and 867 special purpose monitors (SPM) for a total of 5176 sites. These totals compare favorably with the 1984 SLAMS status report which indicated that 1345 NAMS and 3378 SLAMS were operating at the end of 1984. The difference between the 1984 SLAMS report and the audit totals is accounted for by those sites operated by State and local agencies which were not audited. An indication of network stability is gained by looking at the number of reported changes to State and local networks. There were 148 new sites established, 198 sites discontinued, and 101 sites relocated during 1984 for a total of 447 modifications. This total affected approximately 10 percent of the sites covered by the audit and occurred in 52 of the 73 agencies audited. During 1985, about the same number of agencies are planning network changes. Due to the short-term nature of SPM monitoring, no attempt has been made to track these sites on a regular basis.

From the audit reports, it was determined that over 98 percent of the 4309 SLAMS/NAMS operating monitors reported by the 73 agencies audited were in compliance with 40 CFR 58 Appendices D and E. More than half of the monitors not in compliance with Appendices D and E are located in two States which are taking steps to bring these sites into compliance. The remaining sites are scattered over 14 State or local agencies.

Results of the review for compliance with the SLAMS network description and annual review requirements of 40 CFR Part 58 show that all agencies audited maintain a network description and that the descriptions for 7 agencies (or 10 percent) are deficient in one or more of the items required for the description. With respect to adherence to the annual network review, seven agencies did not provide the date of their last review, and eight agencies indicated that the last review occurred prior to 1984. The remaining 58 (79 percent) of the agencies indicated that network evaluations were conducted sometime during 1984 or early 1985.

The audit results pertaining to noncriteria pollutant monitoring showed that 56 of the 73 agencies monitored for one or more noncriteria pollutants. This information was collected to provide some initial knowledge of the variety and magnitude of noncriteria monitoring conducted by the audited agencies. Based on this information, the most frequently monitored substances are organic solvents, metals, acid rain, and sulfates/nitrates. The information collected is not specific enough for a comparison to EPA's priority toxic pollutant listing. Future audits could be adjusted to provide additional information for this purpose. The listing below shows the pollutant monitored and the number of agencies monitoring for each.

Metals	17	Fine Particulate	5
Acid Rain	11	SO ₄ /NO ₃	12
Asbestos	5	Sulfur	1
Solvents	18	Phosphate	1
Formaldehyde	3	Radiation	1
Fluoride	4	Pesticides	2
BaP	4	Freon	1
H ₂ S	7	Chloride	1
NMOC	9		

D. RESOURCES AND FACILITIES

The resource and facility section of the audit was developed to provide additional information about the size of operations, and the adequacy and condition of various resources of each audited agency. Topics considered in this section were as follows:

- Number of nonconforming analyzers
- Instrument needs
- Number of man-years of effort
- Documentation of standard operating procedures for laboratories and availability of necessary equipment
- Availability and traceability of laboratory and field (site) standard reference materials

An analysis of the audit results for the resources and facilities section of the audits provides the following information. There are 23 nonconforming pollutant monitors currently in use in the SLAMS network. This amounts to less than 1 percent of the reported sites. The biggest block of nonconforming monitors (19 of 23) are hi-volume samplers for TSP or Pb which do not conform to the new shelter standards.

Sixty agencies reported various monitoring equipment needs ranging from spare parts to several new monitors or calibration systems. The equipment requests have been categorized in four areas: field equipment which includes such items as pollutant monitors, flow controllers, and shelters; calibration and quality control (QC) equipment, including items like calibration systems, gas dilution systems and rootsmeters; data processing equipment, covering such items as personal computers, data loggers, telemetry equipment, etc.; and meteorological equipment. The table below indicates the broad categories of equipment requested, the number of items, and an estimate of the cost to acquire all of the equipment.

<u>Equipment Type</u>	<u>Number of Items</u>	<u>Cost \$(000)</u>
Field		
(a) Monitors	400	2,800
(b) Shelters, flow controllers	23	97
Calibration-QC	28	107
Data Processing	88	583
Meteorological	<u>30</u>	<u>46</u>
TOTAL	569	3,633

The total cost to purchase all of this equipment is estimated at \$3.6 million. Twenty-four agencies also requested laboratory equipment. This equipment (a total of 35 items) included spectrophotometers, humidity-controlled chambers, microbalances, etc. The estimated cost to acquire these items is \$1.0 million. The total cost to meet the monitoring and laboratory equipment needs identified by the audits is about \$4.6 million. In FY 1986, \$2.4 million in section 105 grant funds were allocated to replace carbon monoxide (CO) and ozone (O₃) monitors and procure additional particulate matter (PM₁₀) samplers. EPA anticipates continuing funding equipment needs at approximately the same level in FY 1987.

The analysis of agency space and staff indicates that 65 percent of the agencies felt they had adequate space to operate their program. To establish a better understanding of the number of people involved in air monitoring, the agencies were asked to break down the number of work-years associated with operating various aspects of their programs. Sixty-two agencies provided tabulated responses to this two-part question. The remaining 11 agencies either did not respond, provided organizational charts which could not be reduced to man-years, or simply indicated their space was adequate. The total number of man-years assigned to 4 specific areas of air monitoring for 63 agencies is shown below.

<u>Program Area</u>	<u>Number</u>	<u>Percent</u>
Network Design & Siting	128	15
Resources & Facilities	347	41
Data & Data Management	172	20
QA/QC	<u>209</u>	<u>24</u>
TOTAL	856	100

The audit showed that 63 agencies or 86 percent of those audited have adequate laboratory standard operating procedures for air quality measurements. However, only 67 percent (49 agencies) indicated that they had sufficient instrumentation available to conduct all necessary laboratory analyses.

The last major area of the facility and resource section audited concerns standards and traceability for laboratory and field site use. The audit indicated 92 percent of the agencies had and could demonstrate adequate reference standards for laboratory use. This percentage drops off to 72 percent for field site standards.

E. DATA AND DATA MANAGEMENT

The principal areas of concern in the area of data and data management are as follows:

- ° Percentage of data submitted on time
- ° Percentage of sites submitting less than 75 percent of the data
- ° Documentation of changes to submitted data
- ° Data changes performed according to a documented standard operating plan
- ° Completeness of the annual SLAMS report.

The pertinent findings of the audits for the data and data management portion of the national audit are discussed below.

Historically, timeliness of data submittal has been a chronic problem; therefore, each audited agency was asked to provide an estimate of the percentage of data submitted within 135 days after the calendar quarter in which it was collected. In general, this requirement applies to NAMS sites; however, most agencies submit their SLAMS data to the NADB and have included their SLAMS in the percentages for data submitted on time. The calculation of data submitted on time is a time-consuming and sometimes difficult statistic to develop retrospectively. An analysis of the percentages submitted by quarter

by pollutant from 68 agencies indicates the quarterly average percent submitted on time varied between 75 percent for lead to 93 percent for carbon monoxide. These percentages seem to be similar to those percentages reported quarterly in the Strategic Planning and Management System (SPMS) reports; however, the audit results are not directly comparable to SPMS numbers because SLAMS sites are included in the audit report and not in the SPMS.

In addition to timeliness of data, completeness of data submittal is of great concern to EPA; therefore, the audits examined the percentage of sites meeting the NADB data completeness criteria (in general, submitting at least 75 percent of the theoretically obtainable data by quarter by pollutant). Similar to the response on timeliness of data, 68 agencies provided data on this question. All of the agencies' responses on data completeness were combined as a national data completeness quarterly audit result compared to the 1984 percentages from the September 1985 quarterly NAMS status report.

Percent of Sites Meeting NADB Criteria

<u>Pollutant</u>	<u>Audit Results</u>	<u>Sept 1985 Quarterly NAMS Report</u>
TSP	92	90
SO ₂	85	88
NO ₂	84	76
CO	90	90
O ₃	91	86
Pb	86	75

A direct comparison of the national audit results with the quarterly NAMS report should be done with caution because the former represents a quarterly average of approximately 4000 sites, and the NAMS report is an average for approximately 1300 sites. The two data sets compare reasonably well, the difference range being 0 (for CO) and 11 percent (for Pb).

The audit indicated that 60 (82 percent) of the audited agencies documented, in a permanent file, any change to air quality data previously submitted to EPA. However, the audit reports showed that only 50 agencies (68 percent) performed these changes according to a documented standard operating procedure. It is assumed that the other 10 agencies which said they documented changes either ignored their established procedure or had no standard procedure for documenting changes to data.

The last area considered under the data management section of the audit was the requirement to submit an annual SLAMS report to EPA. This requirement is applicable to States, the District of Columbia, and United States territories; therefore, local agencies are not considered here. Four particular aspects of the SLAMS annual report are needed for a complete SLAMS report. They are a data summary, annual precision and accuracy information, air pollution episode information, and certification of the report. Of the 51 agencies required to produce a SLAMS annual report, 39 (76 percent) audits showed inclusion of all required elements, while the remaining 12 were deficient in one or more elements of the report. These results are comparable to findings based on those received by the Office of Air Quality Planning and Standards.

F. QUALITY ASSURANCE/QUALITY CONTROL

The Quality Assurance/Quality Control (QA/QC) Section of the national audit program is the last major topic considered in the audits. Consideration was given to the following portions of the audited agencies' QA/QC programs.

- ° EPA approved QA plan
- ° Pending revisions to QA plans
- ° Agency participation in the National Performance Audit Program (NPAP)
- ° Attainment of precision and accuracy goals

Information provided in the QA/QC Section of the audit reports is summarized and discussed below.

Several years ago, EPA approved all of the various agency Quality Assurance Program plans. However, it was not intended that either a QA program or its approval would be a static one-time affair. As a result of program reviews and the changing state of the art, some agency QA programs are outdated or need modification. This is evidenced in the audit results that show 4 out of the 73 audited QA plans need to be revised and approved, and 46 (63 percent) of the audited plans have formal revision proposals pending approval actions. The number of revisions to the QA program plans is a good indication that EPA's concern over quality assurance is being taken seriously. Similarly, the high level of participation in the NPAP, 72 of the 73 audited agencies, demonstrates the deep interest of State and local agencies in the data quality of their air monitoring programs.

The last consideration of the QA/QC Section of the national audit was a measure of the agencies' reporting organizations ability to achieve the precision and accuracy goals specified in the 1985 audit guidance (precision, ± 15 percent for all pollutants; accuracy, ± 15 percent for TSP, ± 20 percent all other pollutants).

Precision and accuracy data are measures of data quality and are based on "reporting organizations." Each State must define at least one or more reporting organization for each pollutant, and each reporting organization should be defined such that the precision and accuracy data reported among all stations are reasonably homogeneous. Nationally, there are approximately 150 organizations.

Usable data (in terms of responses to the questionnaire) for precision were received from 59 agencies, while accuracy data were supplied by 58 agencies. Some of the agencies that did not provide usable data for this section did provide some indication of success in achieving or failing to achieve the goals. The 1985 audit guidance directed that achievement of goals was to be based on each of the last 4 complete calendar quarters prior to the audit for which precision and accuracy data were available; therefore, the data received covered a period between July 1983 and December 1984. To simplify the analysis, a common quarter for all agencies submitting data was chosen. All of the data for the second quarter of 1984 were reduced to produce precision goal achievements (Table 1) and accuracy goal achievements (Table 2).

TABLE 1
FY 1985 AUDIT RESULTS
PRECISION

<u>Pollutant</u>	<u># Reporting Organizations (Rpt. Org.)</u>	<u># of Rpt. Org.'s Meeting Goals</u>	<u>Percent Rpt. Org.'s Meeting Goals</u>
O ₃	85	66	78
NO ₂	53	31	58
SO ₂	82	60	73
CO	76	67	88
TSP	112	83	74
Pb	59	27	46

TABLE 2

FY 1985 AUDIT RESULTS
ACCURACY

<u>Pollutant</u>	<u># Reporting Organizations</u>	<u># of Rpt. Org.'s Meeting Goals</u>	<u>Percent Rpt. Org.'s Meeting Goals</u>
O ₃	84	65	77
NO ₂	52	24	46
SO ₂	81	57	70
CO	75	58	77
TSP	111	104	94
Pb	58	47	81

Achievement of precision goals by reporting organizations as shown in Table 1 varies between 46 percent for lead to a high of 88 percent for CO. The precision of both lead and NO₂ is noticeably lower than the level of the remaining pollutants. Similarly, the achievement of accuracy shown in Table 2 ranges between 46 percent for NO₂ and 94 percent for TSP. The accuracy goals set in the audit guidance are stringent because they were applied to all four accuracy audit levels as opposed to meeting only one of the levels. It is evident that NO₂ accuracy falls considerably below the level achieved by other pollutants and has been attributed to the complexity of the NO/NO₂/NO_x analyzer. It is also possible that the wide CI's associated with NO₂ accuracy estimates is related to the fact that, for most reporting organizations, there are actually few NO₂ sites relative to site counts for the other parameters. In a statistical sense, the presence of even a few relatively large, but still "acceptable" individual audit differences are magnified into large quarterly CI's due to the small number of points actually comprising the statistic.

To provide further perspective on precision and accuracy performance nationally, Table 3 for Precision and Table 4 for Accuracy have been assembled from data submitted to EMSL for calendar year 1984.

TABLE 3

1984 DATA SUBMITTED TO EPA
PRECISION

Pollutant	# Rpt. Org.'s	Probability Limits (%)		Percent of Rpt. Org.'s Meeting Goal + 15%
		Lower	Upper	
O ₃	104	-16	+15	85
NO ₂	66	-20	+21	75
SO ₂	103	-20	+15	85
CO	96	-14	+12	90
TSP	138	-19	+12	75
Pb	72	-25	+27	65

TABLE 4

1984 DATA SUBMITTED TO EPA
ACCURACY (AUDIT LEVEL 1)

Pollutant	# Rpt. Org.'s	Probability Limits (%)		Percent of Rpt. Org.'s Meeting Goal + 20%*
		Lower	Upper	
O ₃	84	-21	+20	85
NO ₂	43	-34	+20	70
SO ₂	103	-24	+20	85
CO	96	-20	+18	90
TSP*	138	-12	+12	95
Pb	72	-15	+18	85

*TSP is based on + 15

Tables 3 and 4 utilize the entire 1984 data base. The upper and lower probability values were selected so that the range would include 90 percent of the reporting organizations for precision and accuracy (audit Level 1). The last column reflects an estimate of the percent of the reporting organizations meeting the audit goals for the 1984 precision and accuracy data submitted to EMSL. The percentage of reporting organizations meeting the audit goals of + 15 percent for precision ranges from 65 percent for Pb to 90 percent for CO.

The goals for accuracy were ± 15 percent for TSP and ± 20 percent for all other pollutants. The range of percentages for reporting organizations achieving the accuracy goals in Table 4 is from 70 percent for NO_2 to 95 percent for TSP. The 1984 values shown in Tables 3 and 4 are about the same as the 1983 levels.

Tables 1 and 3 or 2 and 4 are not directly comparable to each other because of the difference in period of record and number of reporting organizations used. However, it is evident that goal achievement is higher for all pollutants based on the 1984 annual data submitted to EMSL. Furthermore, the extent of the range (the percent of reporting organizations meeting the precision and accuracy goals) for Tables 3 and 4 is smaller than the corresponding Tables 1 and 2.

Based on the two sets of tables, NO_2 for both precision and accuracy shows up with lower values than the other pollutants. This may be related to the complexity of the NO_2 instrument and the related instrument audit procedure, and the limited number of NO_2 instruments operated by the various reporting organizations. The low level of achievement for lead may be related to the procedure which analyzes two strips from the same filter. In general, ambient lead levels are low. This would magnify any very small differences in the analytical results between the two strips to rather large percentage differences.

VII. VEHICLE INSPECTION/MAINTENANCE

EXECUTIVE SUMMARY

While the audit process for inspection/maintenance programs did not become part of the National Air Audit System (NAAS) until FY 1985, EPA actually started inspection/maintenance (I/M) audits in FY 1984. Eight I/M programs were audited in FY 1984 and another eight I/M programs were audited in FY 1985. The results of these sixteen audits are included in this report.

Enforcement is a problem in some programs with sticker based enforcement. Five of the 16 programs audited had enforcement problems.

Low reported failure rates are a problem in most decentralized programs, especially in those using manual analyzers and in some centralized government-run programs. Nine of the 16 programs audited were experiencing lower than expected failure rates.

High waiver rates are a problem in some programs, both centralized and decentralized. In total, 4 of the 16 programs audited had apparent excessive waiver rates for at least some vehicle categories.

Analyzer quality assurance ranges from excellent in centralized contractor programs to marginal in both decentralized programs with manual analyzers and some centralized government-run programs. Ten of the 16 programs audited need improvements in this area.

Data analyses are not being effectively used in most programs to monitor and improve program performance and the performance of individual inspection stations. Thirteen of the 16 programs need to improve their data management programs. The quality of I/M repairs is a problem, to some extent, in every program audited.

The EPA believes that the resolution of these problems generally rests with each State/local I/M program developing an overall I/M quality assurance program to ensure that problems are identified and resolved in a timely manner. This overall system needs to monitor and assure adequate enforcement, adherence to procedures for testing and record keeping, and proper diagnosis and repair of failed vehicles.

Identifying operating problems is an important first step in assuring quality I/M programs. The results of completed audits are being used by State/local agencies and EPA to improve I/M programs. The EPA believes that the I/M audit system and guidelines will continue to be a dynamic and vital process for achieving environmental results.

A. INTRODUCTION

Auditing of State/local motor vehicle I/M programs was added to the NAAS in FY 1985. The EPA actually started the I/M audit program in FY 1984 when eight pilot audits were conducted in the spring and summer of 1984. The results of these FY 1984 audits are being included in this report. Eight additional audits occurred in FY 1985. Table 7-1 lists the I/M programs audited in FY 1984 and FY 1985, the dates of each audit, and the type of I/M program in each State. Table 7-2 (on p. VII-11) summarizes the operating details of the 16 programs.

Table 7-1
FY 1984/85 I/M Audits

<u>Location</u>	<u>Dates</u>	<u>Program Type*</u>
Connecticut	5/14 - 5/16/84	A
Massachusetts	5/16 - 5/18/84	D
Colorado	5/21 - 5/23/84	C
Arizona	5/23 - 5/25/84	A
District of Columbia	6/04 - 6/06/84	B
Virginia	6/06 - 6/08/84	C
Memphis, TN	6/27 - 6/29/84	B
New Jersey	7/10 - 7/13/84	BC
Nevada	10/15 - 10/19/84	C
New York	12/10 - 12/14/84	D
Georgia	1/22 - 1/25/85	C
Missouri	3/04 - 3/08/85	C
Delaware	3/07 - 3/08/85	B
North Carolina	3/18 - 3/22/85	C
Texas	3/26 - 3/27/85	C
	4/02 - 4/04/85	
Oregon	4/15 - 4/19/85	B

*A = centralized, contractor

B = centralized, government-run

C = decentralized

D = decentralized with computerized analyzers

The primary purpose of the I/M audit is to allow EPA to ensure that each State or locality is implementing and enforcing its I/M program in a manner consistent with its State implementation plan (SIP). Another objective of the audit is to identify areas where EPA can provide assistance to strengthen I/M programs. This includes either specific aid to a particular State or more general assistance aimed at resolving an overall technical issue.

The I/M audit questionnaire and the audit visit are structured to allow EPA and the State to determine what, if any, program improvements may be required to enable SIP goals and commitments to be met. The I/M questionnaire is in two sections--one dealing with design and intended operating aspects and the other with actual recent operating experiences.

The on-site audit visit includes various activities designed to provide an in-depth analysis of the I/M program. These activities include records reviews, inspection station visits, interviews with program officials, and special surveys.

B. MAJOR FINDINGS AND CONCLUSIONS

1. Major Findings

The following major findings resulted from the completed I/M audits:

- a. Enforcement - EPA auditors found that the rate of compliance among vehicle owners ranged from greater than 95 percent in some States to less than 50 percent in other States. The problems noted were in sticker-based enforcement programs.
- b. Reported failure rates - EPA auditors found reported failure rates as high as 35 percent and as low as 2 percent. Very low reported failure rates indicate inspection error, or at least data reporting errors. These problems were prevalent in most decentralized programs and in some government-run, centralized programs.
- c. Waiver rates - EPA auditors found that waiver rates varied considerably among the programs audited. A few programs do not allow waivers. In some States, the waiver rates appeared excessive.
- d. Analyzer quality assurance - EPA auditors found quite a variation in analyzer quality assurance among the audited programs. In the centralized contractor programs, analyzer quality assurance was excellent. In decentralized programs with manual analyzers and in some centralized government-run programs, analyzer quality assurance was marginal.

- e. Data analyses - EPA auditors found that, with only a few exceptions, I/M programs are failing to effectively use available program data to monitor and take steps to improve program performance and performance of individual inspection stations.
- f. Quality of I/M repairs - EPA auditors found that in every program, to some extent, a problem exists with respect to the quality of I/M repairs.

2. Conclusions

EPA believes that the resolution to the problems in operating I/M programs generally rests with each State/local I/M program developing an overall I/M quality assurance program to ensure that problems are identified and resolved in a timely manner. Through such systems, program managers need to track:

- a. The level of noncompliance among vehicle owners.

This is particularly important in nonregistration enforcement systems. However, even registration enforcement is not necessarily exempt from problems.
- b. The performance of inspection stations to make sure that vehicles are receiving fair, equitable, and accurate inspections.

This involves inspection station audit and surveillance activities as well as tracking performance through data analysis. Obviously, the latter is possible only if accurate data are collected.
- c. The performance of the program itself.

Program data need to be summarized and analyzed to ensure that cutpoints, failure rates, waiver rates, and other program statistics are within acceptable limits.
- d. The quality of repairs.

Quality repairs are the backbone of I/M. Program data need to be reviewed to ensure that vehicles are not being improperly or incorrectly repaired. Retest failure rates and comparisons of before- and after-repair emissions levels can be useful indicators to assess the quality of I/M repairs.

C. ENFORCEMENT

Enforcement - EPA auditors found that the rate of compliance among vehicle owners ranged from greater than 95 percent in some States to less than 50 percent in other States. Five of the 16 programs audited had enforcement problems.

Three enforcement methods are currently used in I/M programs:

1. Registration based enforcement.
2. Sticker enforcement.
3. Data-link enforcement.

The I/M audits have not identified any problems in registration enforcement programs, although these systems have potential problems with motorists improperly registering their vehicles outside the I/M area to avoid the program, with police failing to ticket vehicles for expired license plates, and with clerical errors in the registration process which might allow uninspected vehicles to be registered. No audits have yet been conducted for programs which use data-link enforcement.

The enforcement problems that have been identified in the I/M audits are with sticker-based enforcement. Of the first eight sticker enforcement programs audited, four had serious levels of noncompliance (in excess of 20 percent of vehicles in noncompliance).

The problems in sticker-based enforcement programs tend to be caused by the indifference of police officers to sticker violations and by the failure of police departments to devote the necessary resources or to accept the risk to public goodwill. In some cases, there are also problems because of an inability of police officers to distinguish subject vehicles from exempt vehicles and to distinguish expired stickers from valid ones. Limitations are also imposed in some cases because police are not authorized to ticket parked vehicles.

Another problem area in some programs was sticker accountability. The EPA auditors found that some programs have very thorough sticker accountability procedures while others do not. In order to ensure the proper disposition of stickers, State/local agencies need to confirm that each approval sticker has a matching inspection record showing passing results. (This same confirmation is needed in nonsticker programs for approval certificates, except where the approval certificates and official inspection reports are printed automatically by machine.) This confirmation is accomplished in some current programs by correlating sticker serial numbers to inspection reports and then reviewing inspection records, sticker records, and sticker supplies during audits. In programs with

automated data collection, sticker serial numbers can be easily recorded in the inspection report and reviewed through routine data analyses. Because of the potential for data loss in some of these systems, State/local agencies need to be cautious about totally relying on the automatic records. Serial numbers for which no passing test data can be found should be checked against paper records kept at the inspection station or centrally. Alternatively, all serial number/passing test verification can be done manually.

D. REPORTED FAILURE RATES

Reported failure rates - EPA auditors found reported failure rates as high as 35 percent and as low as 2 percent. Nine of the 16 programs audited were experiencing lower than expected failure rates.

Reported failure rates were consistently much lower than (less than half) the designed failure rates in decentralized programs. (One exception was a decentralized program with computerized analyzers.) Also, there were low failure rates reported in one government operated, centralized program. All contractor operated centralized programs had reported failure rates in the designed range.

There are several reasons for the low failure rates. In a few cases, the failure rates are low because the I/M cutpoints are too lenient. However, most of the problems with low reported failure rates, especially in decentralized programs, are caused by either pre-inspection repairs, mistakes or cheating by inspectors, or some combination of these three factors. The EPA believes that a strong inspection station surveillance program is needed to ensure proper station performance. This surveillance program should include regular station audits, spot checks with unmarked vehicles, and the ability to gauge and track station performance through data analyses. Spot checks with unmarked vehicles set to fail inspection should be considered an indispensable part of the oversight function in a decentralized program, particularly a program with manual analyzers.

E. WAIVER RATES

Waiver rates - EPA auditors found that waiver rates varied considerably among the programs audited. A few programs do not allow waivers. In some States, the waiver rates appeared excessive (greater than 10 percent of failed vehicles receiving waivers). In one State, the overall waiver rate was about 13 percent of failed vehicles. In another case, approximately 50 percent of the 1981 and newer vehicles which failed were receiving waivers. In total, 4 of the 16 programs audited had apparent excessive waiver rates for at least some vehicle categories.

The reasons for the excessive waivers varies to some extent with the type of program. In centralized programs and other programs where the State/local agencies process waiver applications, the problem tends to be a failure on the part of the agency to adhere to strict processing procedures. In such cases, vehicles which receive improper or irrelevant repairs are granted waivers as long as the repair cost ceiling, and other criteria if any, are met. If repair facilities have learned that owners never have to return for a better repair, they have much less incentive to perform only relevant repairs and to perform them correctly. To date, program officials in centralized programs have not spent the effort to create other motivations for good repairs and to find the repair facilities most in need of improvement.

In decentralized programs where the inspection stations have the authority to grant waivers, high waiver rates tend to be caused primarily by a lack of close scrutiny by the State/local agency. In these cases, the agencies do not track waiver rates by inspection station and do not investigate questionable waiver transactions. Waiver rates seem to be particularly high in those decentralized programs which use mandatory repair sequences (i.e., all or some failed vehicles must have dwell, timing, air/fuel ratio, and idle speed adjustments only) rather than cost limits.

In decentralized programs where the State agencies process all waivers, the waiver rates are surprisingly low. In fact, the waiver rates in some cases are so low that it reinforces the suspicion that vehicles are not being failed correctly at reinspection.

In some cases, a secondary problem contributing to high waiver rates in both centralized and decentralized programs is the use of relatively low waiver cost ceilings. Over half of the current operating programs have waiver cost ceilings of \$55 or less.

F. ANALYZER QUALITY ASSURANCE

Analyzer quality assurance - EPA auditors found quite a variation in analyzer quality assurance among the audited programs. In the centralized, contractor programs, analyzer quality assurance was excellent. However, in decentralized programs with manual analyzers and in some centralized, government-run programs, analyzer quality assurance was marginal. This group included 10 of the 16 programs audited. These problems were caused by several factors:

1. Lack of a comprehensive program of preventive and corrective maintenance.
2. Lack of thorough audit/surveillance activities for inspection stations.
3. In some cases, existing analyzers are rather old.

G. DATA ANALYSES

Data analyses - EPA auditors found that, with only a few exceptions, I/M programs are failing to effectively use available program data to monitor and take steps to improve program performance and performance of individual inspection stations. Of the 16 programs audited, 13 should improve their data management programs.

In cases where inspection data are collected manually, there are a number of problems which prevent, or at least limit, the collection of accurate data. In some cases, records are illegible and therefore unusable. A more serious problem, and one that is more difficult to resolve, is that in many cases inspectors do not correctly record data. The EPA auditors found that manually collected data records often contain easily identified patterns of record keeping (or other) abuses. In most cases, however, the State/local agencies tend to categorize the problem of poor record keeping as inevitable rather than attempting to resolve it. Abuses which are limited to record keeping of themselves may not be serious threats to air quality objectives. However, there at least needs to be a way to analyze the data to distinguish between record keeping errors and more serious infractions, such as falsification of test results in order to improperly pass a vehicle with high emissions or to avoid inspecting a vehicle at all. By screening inspection data, agency field investigators should be able to identify questionable transactions or problem stations. Therefore, EPA considers emphasis on collecting and analyzing valid data to be a high priority.

In cases where data are collected automatically, the data are generally available to program officials, although there have been problems with data loss in some cases. The problem in these cases tends to be an inability to use the data effectively. In some cases, the State/local agencies have placed little priority on developing computer programs to analyze data. In other cases, the data are over-analyzed with many useless reports being generated. This latter situation often leaves the program managers overwhelmed by the data and confounds their ability to focus on the useful reports.

H. QUALITY OF I/M REPAIRS

Quality of I/M repairs - EPA auditors found that in every program, to some extent, a problem exists with respect to the quality of I/M repairs.

State and local agencies are providing minimal attention to assurance of quality repairs to failed vehicles. All too often it appears that vehicles are adjusted to meet I/M cutpoints with a small margin of safety rather than being adjusted near manufacturer specifications. This results in much lower emissions reductions being achieved.

I. EVALUATION OF THE FY 1985 AIR AUDIT EFFORT

The eight FY 1984 I/M program audits were intended to test the auditing concepts planned for the FY 1985 audit guidelines. The eight FY 1985 I/M audits were more comprehensive in scope and were able to rely on the established guidelines and questionnaires. The EPA believes that the FY 1984 and FY 1985 I/M audits were successful in establishing a long term process for evaluating and improving operating I/M programs.

One measure of the success of the audit program can be obtained by reviewing feedback from the State/local officials who participated in the audits. To obtain this feedback, EPA surveyed officials in the eight I/M programs audited in FY 1985. In summary, the major comments were generally as follows:

1. On questionnaires, most commenters indicated that they would have preferred getting the questionnaires sooner than they did. They felt, in some cases, that EPA should have done a better job of filling out the questionnaire before it was sent to the State. A few commenters indicated a preference for a State-specific questionnaire or a separate questionnaire for decentralized and centralized programs; however, they agreed that better completion and screening of questions by EPA would have minimized their problems with the current questionnaire.
2. Most commenters indicated that draft reports should have been sent to the States sooner or, at a minimum, EPA should formally follow-up with the State on the major findings of the audit in a timely manner. Some States indicated that they had no formal contact with EPA on the audit between the audit exit meeting and the receipt of the draft audit report. In some cases, this represented a time gap of up to 6 months. Most commenters felt that better follow-up was needed in order to focus on problems, to develop reasonable and timely resolutions, and to set priorities and schedules. Such audit follow-up activities should be discussed in the audit report to make the document current at the time of its release.
3. Some commenters indicated that EPA should have had better pre-planning for site visit activities and better coordination with the State/local agencies prior to the audit visit. In a few cases, site visit activities were not planned until the audit team arrived on site. Some commenters felt that EPA should improve communications and coordination efforts with the nonair State/local agencies that are involved with the I/M programs. In some cases, all coordination efforts with these agencies were inappropriately delegated to the State/local air agencies.

4. One commenter suggested and others agreed that EPA should place more emphasis on involving officials from other State/local programs on the audit team. Participating officials from other States/localities should be from States/localities with I/M programs similar to the one being audited.
5. Another suggestion was to involve EPA officials from an EPA Regional Office other than the one handling the audit. This would help to ensure consistency and to overcome any biases which may have developed within the host Region. It was again stressed that the visiting personnel be familiar with programs similar to the one being audited.
6. A few commenters felt that the State/local officials "evaluating" the audits was a good way of getting constructive feedback on the audit process and that EPA should solicit such evaluations as part of the audit process. It was felt that these evaluations should occur soon after the audit visit and follow-up activities were conducted.

In view of the comments received, there was no apparent need for major revisions to the I/M audit guidelines or questionnaires for FY 1986 and FY 1987. The major need is simply to improve the administrative process of implementing the guidelines. The EPA believes that the main reason for the logistical problems experienced in FY 1985 was that the I/M audits were a new part of the National Air Audit System. This first year's learning experience by itself will yield improvements for later years.

Even though no major revisions were apparently needed in the guidelines or questionnaires, two areas were identified for minor changes in the FY 1986/87 I/M audit guidelines. One change was to add a short discussion to the guidelines on audit visit exit meetings. This change was made to clarify that exit meetings occur at a point in the audit process when only tentative conclusions can be drawn, since much information and data cannot be fully evaluated during the audit visit itself.

The other area for minor change was in the instructions for the audit questionnaires. To avoid some of the logistical problems with the questionnaires, the instructions were modified to clarify that EPA personnel are to initially complete as much as possible of the questionnaire and to clearly mark those questions which do not apply to a particular State/local program.

Identifying operating problems is an important first step in providing quality I/M programs. The results of completed audits are already being used by State/local agencies and EPA to improve I/M programs. The EPA believes that the I/M audit system and guidelines will continue to be a dynamic process for achieving environmental results.

Table 7-2
Description of I/M Programs
Audited in FY-84/85

Region/ State/Areas	Program Start	Type	Tamper Test	Waiver	Test Fee \$	Vehicles Included	Exemp- tions	Light Duty Years	Cutpoints CO HC % ppm
I									
CT Statewide	1/83	CC	Waiver	C 40	10	1968+ to	M	1968-1969	7.5 750
		SE	P,A,S	E		10,000 lbs.	D	1970	7.0 650
		A	E,C,I					1971	6.0 650
		I	R,T					1972	6.0 575
								1973-1974	6.0 425
								1975-1979	3.0 300
								1980	2.5 275
								1981+	1.2 220
MA Statewide	4/83	D	Always	C 100	10	Last 15	M	1970-1974	7.0 800
		SE	I	or 10%		years to	D	1975-1979	4.0 400
		A	1980+	of value		8500 lbs.		1980	2.7 300
		I	C	and				1981+	1.2 220
		S	Waiver	L					
			All	E					
II									
NJ Statewide	2/74	H	None	None	2.50°	All years	M	Pre-1968	8.5 1400
		SE			C	to 6000	D	1968-1970	7.0 700
		A			12°	lbs.		1971-1974	5.0 500
		I			D			1975-1980	3.0 300
		S						1981+	1.2 220
NY NYC metro:	1/82	D	Always	L	6.50	All years	M	Pre-1975	6.5 800
Bronx		SE	1984+			to 8500	D	1975-1977	5.7 700
Kings		A	P,A,E			pounds		1978	4.3 500
Nassau		I	C,I,R					1979	3.0 400
New York		S	T					1980	2.7 330
Putnam								1981+	1.2 220
Queens									
Richmond									
Rockland									
Suffolk									
Westchester									

Program Type Key
D = decentralized
CL = central local-run
CC = central contractor
CS = central state-run
H = cntrl/dcntrl hybrid

Program Type Key
RE = registration-enforced
SE = sticker-enforced
RS = registration & sticker
A = annual inspection
B = biennial inspection

Tamper Test Key
P = PCV
A = air injection
S = spark system
E = evap system
C = catalyst
I = inlet
T = air intake
R = EGR

Waiver Key
C = cost waiver/\$
R = reduction/%
L = stated repairs
E = tamper repair costs excluded

Test Mode
I = idled
L = loaded/deed idle
R = two speed idle
S = safety

°Includes safety inspection fee.

Exemption Key
M = motorcycles
D = diesels

Table 7-2 (cont.)

Region/ State/Areas	Program Start	Type	Tamper Test	Waiver	Test Fee \$	Vehicles Included	Exemp- tions	Light Duty Years	Cutpoints CO %	HC ppm
III										
DC city-wide	1/83	CL SE A I S	None	None	5 ^o	All years to 6000 lbs.	M D	Pre-1968 1968-1970 1971-1974 1975-1979 1980+	12.5 11.0 9.0 6.5 1.5	2000 1250 1200 600 300
DE Wilmington: New Castle	1/83	CS RE A I S	None	C 75	None	1968+ to 8500 lbs.	M D	1968-1970 1971-1974 1975-1979 1980 1981+		1100 800 500 275 220
VA DC suburbs: Arlington Fairfax Co. Prince William Fairfax Alexandria Falls Church Manassas Manassas Park	12/81	D RS A I S	Always All devices	C 75 or L E	5	Last 8 years to 6000 lbs.	M D A	1977-1979 1980 1981+	4.0 2.0 1.2	400 220 220
IV										
GA Atlanta: Cobb DeKalb Fulton Gwinnett	4/82 1/86	D SE A I	Always P,A,S E,C,I R	C 50 E	3	Last 10 years to 6000 lbs.	M D	1975-1979 1980+	4.0 2.5	400 250
NC Charlotte: Mecklenburg	12/82	D SE A I S	Always P,A,C I,R,T	C 50 E	10 ^o max	Last 12 years, all vehicles	M D	1973-1974 1975-1978 1979-1980 1981+	7.0 5.0 3.0 1.5	
TN Memphis: Shelby	8/83	CL RE A I S	Waiver C,I	C 50 or L E	None	All years to 8500 lbs.	M D	Pre-1972 1972-1974 1975-1979 1980 1981+	9.9 9.0 8.5 6.5 3.0	1990 1990 1990 1990 1990

Program Type Key
D = decentralized
CL = central local-run
CC = central contractor
CS = central state-run

Test Mode
L = loaded
I = idle
R = two speed idle
S = safety

Program Type Key
RE = registration-enforced
SE = sticker-enforced
RS = registration & sticker
A = annual inspection

^oIncludes safety
inspection fee.

Tampering Key
P = PCV
A = air injection
S = spark system
E = evap system
C = catalyst
I = inlet
R = EGR
T = air intake

Waiver Key
C = cost waiver/\$
R = reduction/%
L = stated repairs
E = tamper repair
costs excluded

Exemption Key
D = diesels
A = air-cooled
M = motorcycles

Table 7-2 (cont.)

Region/ State/Areas	Program Start	Type	Tamper Test	Waiver	Test Fee \$	Vehicles Included	Exemp- tions	Light Duty Years	Cutpoints CO HC % ppm
VI TX Houston: Harris	7/84	D SE A T S	Always P,E,A,R,T 1980+: C,I,L,X 1984+ O	None	2.75 1980+	1968+ to 8500 lbs.	M D O	None	

VII

MO St. Louis: 1/84	D	Always	L	4.50	1971+ to	M	1971-1974	7.0	700
St. Charles	RE	P,A,E,R		max	6000 lbs.	D	1975-1979	6.0	600
St. Louis	A	1981+			licensed	O	1980	3.0	300
St. Louis City	I	C,I			weight		1981+	1.2	220
Jefferson	S								

VIII

CO Denver: 1/82	D	Always	1968-80	10	1968+ to	M	1968-1971	6.0	1200
Adams	SE	1982+	L 15	max	10,000 lbs.	D	1972-1974	5.4	1200
Arapahoe	A	A,C,I	1981+			O	1975-1976	5.0	800
Boulder	I		C 100				1977-1978	3.4	500
Denver	R 81+		E				1979	2.0	400
Douglas							1980+	1.5	400
Jefferson									
Colorado Springs:									
El Paso									
Fort Collins:									
Larimer									

Program Type Key

D = decentralized
CL = central local-run
CC = central contractor
CS = central state-run

Test Mode

I = idle
R = two speed idle
L = loaded
T = tampering
S = safety

Program Type Key

RE = registration-enforced
SE = sticker-enforced
RS = registration & sticker
CM = computer matching
A = annual inspection

Tampering Key

P = PCV
A = air injection
R = EGR
E = evap system
C = catalyst
I = inlet
O = oxygen sensor
T = air intake
L = Plumbtesmo
X = replace cat if
inlet tampered

Waiver Key

C = cost waiver/\$
R = reduction/%
L = stated repairs
E = tamper repair
costs excluded

Exemption Key

M = motorcycles
D = diesels
O = other fuels

Table 7-2 (cont.)

Region/ State/Area IX	Program Start	Type	Tamper Test	Waiver	Test Fee \$	Vehicles Included	Exemp- tions	Cutpn- ts Years	4cyl CO %	HC ppm	6-8 CO %	cyl HC ppm																																																				
AZ Phoenix: Maricopa Tucson: Pima	1/77	CC RE A I	None	C 50 R 40%	5.44	Last 13 years, all vehicles	D	1972-1974 1975-1980 1981+	6.0 2.5 1.5	450 250 250	5.5 2.2 1.5	400 250 250																																																				
NV Las Vegas: Clark Reno: Washoe	10/83	D RE A R	Waiver 1975+ C	Pre-82 L 14 1982+ C 100 E	8	1965+ to 5000 lbs. curb wt.	M D O	1965-1967 1968-1969 1970-1974 1975+	7.5 5.0 4.0 3.0																																																							
X																																																																
OR Portland: Multnomah Clackamas Washington	7/75	CS RE B R:81+ I:pre 81	Always 1975+ P,A,S E,C,I R,T,M,O 1970-74 P,A,E	None	7	Last 20 years	M D over 8500 lbs.	Cutpoints established by model year and make, detailed list available. Most 1975+ vehicles: 1.0% CO, 225 HC																																																								
<table><tr><td><u>Program Type Key</u></td><td><u>Program Type Key</u></td><td><u>Tampering Key</u></td><td><u>Waiver Key</u></td></tr><tr><td>D = decentralized</td><td>RE = registration-enforced</td><td>P = PCV</td><td>C = cost waiver/\$</td></tr><tr><td>CL = central local-run</td><td>SE = sticker-enforced</td><td>A = air injection</td><td>R = reduction/%</td></tr><tr><td>CC = central contractor</td><td>RS = registration & sticker</td><td>R = EGR</td><td>L = stated repairs</td></tr><tr><td>CS = central state-run</td><td>CM = computer matching</td><td>E = evap system</td><td>E = tamper repair</td></tr><tr><td></td><td>A = annual inspection</td><td>C = catalyst</td><td>costs excluded</td></tr><tr><td></td><td>B = biennial inspection</td><td>I = inlet</td><td></td></tr><tr><td><u>Test Mode</u></td><td></td><td>M = computer module</td><td><u>Exemption Key</u></td></tr><tr><td>I = idle</td><td></td><td>T = air intake</td><td>M = motorcycles</td></tr><tr><td>R = two speed idle</td><td></td><td>S = spark system</td><td>D = diesel fuels</td></tr><tr><td>L = loaded</td><td></td><td>O = oxygen sensor</td><td>O = other fuels</td></tr><tr><td>S = safety</td><td></td><td></td><td></td></tr><tr><td>T = tampering</td><td></td><td></td><td></td></tr></table>													<u>Program Type Key</u>	<u>Program Type Key</u>	<u>Tampering Key</u>	<u>Waiver Key</u>	D = decentralized	RE = registration-enforced	P = PCV	C = cost waiver/\$	CL = central local-run	SE = sticker-enforced	A = air injection	R = reduction/%	CC = central contractor	RS = registration & sticker	R = EGR	L = stated repairs	CS = central state-run	CM = computer matching	E = evap system	E = tamper repair		A = annual inspection	C = catalyst	costs excluded		B = biennial inspection	I = inlet		<u>Test Mode</u>		M = computer module	<u>Exemption Key</u>	I = idle		T = air intake	M = motorcycles	R = two speed idle		S = spark system	D = diesel fuels	L = loaded		O = oxygen sensor	O = other fuels	S = safety				T = tampering			
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This table summarizes characteristics of the 16 I/M programs audited in FY 1984/85. These characteristics have been derived from statutes and/or rules and regulations promulgated by the State or locality. The list includes the names of counties, cities, and States implementing I/M; however, in some areas only part of the county listed is involved, not the entire county. The date listed under Program Start is the actual start date of the mandatory I/M program; in some cases, voluntary programs started earlier. The Program Type column indicates whether the program is centralized or decentralized, what type of enforcement mechanism is being used, the test type, and frequency. The Tamper Type column indicates when tampering inspections are conducted and which components are checked. A key to abbreviations is provided at the bottom of each page. Test fees may include safety inspection which is indicated by a degree symbol. The cutpoints are for light duty vehicles only.

TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA-450/2-85-009	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE National Air Audit System-FY 1985 National Report		5. REPORT DATE December 1985
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Air Quality Planning and Standards U.S. Environmental Protection Agency Research Triangle Park, North Carolina 27711		10. PROGRAM ELEMENT NO. 13A2A
		11. CONTRACT/GRANT NO. 68-02-3892
12. SPONSORING AGENCY NAME AND ADDRESS Director, Office of Air Quality Planning & Standards Office of Air and Radiation U.S. Environmental Protection Agency Research Triangle Park, North Carolina 27711		13. TYPE OF REPORT AND PERIOD COVERED Final - FY 1985
		14. SPONSORING AGENCY CODE EPA/200/04
15. SUPPLEMENTARY NOTES		
16. ABSTRACT The National Air Audit System, which was jointly developed by EPA and representatives of State and local air pollution control agencies was implemented for the first time in FY 1984. In FY 1985, the system audited air pollution control activities in 68 State and local agencies in the areas of air quality planning and State implementation plan activity, new source review, compliance assurance, air monitoring, and inspection and maintenance. The goals of the audit system are to identify obstacles that are preventing State and local agencies from implementing effective air quality management programs and to provide EPA with quantitative information for use in defining more effective and meaningful national programs. The report for FY 1985 indicated that, for the most part, State and local agencies have sound programs in each of the four audited areas. Areas of possible improvement were found, however, which will be the focus of various remedial activities.		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air pollution Air audit Air quality planning New source review Compliance assurance Air monitoring Inspection and maintenance	Air Pollution Control	13B
18. DISTRIBUTION STATEMENT Release unlimited. Available through NTIS	19. SECURITY CLASS (This Report) Unclassified	21. NO. OF PAGES 129
	20. SECURITY CLASS (This page) Unclassified	22. PRICE