United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-340/1-85-020
September 1985

Stationary Source Compliance Series

Air Compliance Inspection Manual

EPA-340/1-85-020

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Stationary Source Compliance Series
Office of Air Quality Planning and Standards
Washington, DC 20460

September 1985

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ACKNOWLEDGEMENTS

Development and preparation of a manual such as this is dependent on the assistance and input of a number of agencies, organizations, and individuals. In particular, much of the information, guidelines, and procedures included herein were derived or abstracted from manuals or publications already developed by the Environmental Protection Agency, state agencies, groups concerned with air enforcement affairs, as well as from related publications and manuals reviewed during the course of the project.

In addition, grateful acknowledgement is extended to the staff of the following EPA offices who gave their critical comments and suggestions and made key contributions to the improvement of this manual: Region I, Region II, Region III, Region IV, Region V, Region VI, the Office of Enforcement and Compliance Monitoring (OECM), the Office of General Counsel (OGC), the Emission Measurement Branch (EMB), and the Stationary Source Compliance Division (SSCD).

Sincere appreciation is also extended to Kirk E. Foster, of the Stationary Source Complinace Division who served as the EPA Task Manager, for his guidance and assistance throughout the task, in locating and incorporating the most up-to-date and relevant information.

Work on this manual was performed under two EPA contracts. They were Contract No. 68-02-3960 to Engineering-Science (Work Assignment No. 40) and Contract No. 68-02-3962 to JACA Corporation (Work Assignment No. 72). Ms. Robin R. Segall of Entropy Environmentalists, Inc. served as the lead author and incorporated all the review comments and other revisions. Other contributing authors were Mr. J. Calvin Thames of Engineering-Science, Dr. John R. Richards of Richards Engineering, and Mr. William G. DeWees of Entropy Environmentalists.

As previously mentioned, this manual has been extensively reviewed by the staff of six EPA Regional Offices and, in general, represents their standard procedures and practices for conducting air compliance inspections. However, changes in practices can be anticipated and revisions will occur as field experience with the manual is gained.

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FOREWORD

The Air Compliance Inspection Manual has been developed to support inspection personnel in conducting the field inspections which are necessary to promote stationary source compliance by providing inspectors with access to standardized procedures for conducting complete, accurate air compliance and other types of air-related inspections.

The depth of coverage of the material in the manual is intended to provide the qualified inspector with the basic guidance necessary to perform a organized and thorough inspection. The manual presents standard procedures relevant to the majority of air compliance inspections; it is assumed that the inspector has a basic knowledge of air pollution control technologies. However, new inspection personnel should find the manual useful in developing an orderly and detailed approach to conducting an inspection and for identification of subject areas for further inquiry. It is obvious that all information relevant to conducting an effective inspection could not be included in one volume; thus, in instances where additional appropriate information is available, the reader has been further referred in the form of footnotes and reference lists at the end of each chapter. In addition, this manual seeks to focus primarily on the inspection portion of the national air compliance enforcement effort; the reader is specifically referred to the Clean Air Act Compliance/Enforcement Guidance Manual* for extensive information on the EPA's enforcement and compliance monitoring policy.

The technical portion of the manual emphasizes the inspection and evaluation of particulate emission sources. This was done for several reasons: (1) among the major types of pollutant control, particulate controls are the most widespread; (2) these controls have been in place longer; (3) more refined inspection techniques have been developed for particulate controls; and (4) the basic approach to the particulate inspection can easily be adapted to other types of air pollutants. It is planned that future updates to the manual will contain additional material specific to the other regulated pollutants.

The manual is organized into eight chapters. The chapters are further divided into numbered sections to accommodate the large amount of material in some chapters. Chapter contents are summarized below.

- Chapter 1.0 Overview and Introduction - outlines the basis for air compliance inspections according to the Clean Air Act and the scope of existing Federal and State regulations. Inspector responsibilities and liabilities are also addressed.

- Chapter 2.0 Compliance Monitoring and the On-Site Inspection - examines the roles and purpose(s) and levels of EPA and State conducted compliance inspections. Also addressed are the

*Clean Air Act Compliance/Enforcement Manual, draft report, 1984.

methods used to select facilities for inspection, inspection frequency, inspection complexity, and current alternatives to the on-site inspection for compliance monitoring.

- Chapter 3.0 General Inspection Procedures - details a standardized set of general procedures common to all types of air compliance inspections including pre-inspection preparation, entry, opening conference, documentation, closing conference, file update, and inspection report preparation. Also addressed are procedures for the handling of confidential business information and chain of custody documentation.

- Chapter 4.0 Recordkeeping and Reporting - discusses recordkeeping and reporting requirements under the various categories of regulations. It also outlines procedures for reviewing a source's compliance with applicable requirements.

- Chapter 5.0 Inspection Safety - addresses the safety considerations which should be a part of all field inspections. Topics covered include types of hazards encountered, appropriate personnel protection equipment, safety procedures, and the U. S. Environmental Protection Agency's Safety Program.

- Chapter 6.0 Visible Emission Observation - summarizes the procedures for making and documenting a visible emissions observation. Major points relevant to making the observation for control device performance evaluation or enforcement purposes are discussed. The reader is referred to recent procedural guidelines for more detailed information.

- Chapter 7.0 Observing the Compliance Test - covers procedures for the compliance test observation since it is often the responsibility of the field inspector. Topics covered include pretest review of sampling protocols, establishing representative conditions for facility operations, using test data to create a baseline data set, appropriate observations during the test, test report review, and observation documentation.

- Chapter 8.0 Baseline Inspection Procedures for Air Pollution Control Systems - provides logical sets of inspection data and diagnostic inspection methodologies for each level of inspection for the major types of particulate control equipment including fabric filters, electrostatic precipitators, mechanical collectors, and wet scrubbers. Included are detailed explanations of baseline evaluation procedures and the preparation of baseline data sets using performance test reports and previous inspection reports. Also included are procedures for fugitive dust inspections and information on assembling a technical library on processes and control equipment.

The information contained in this manual is comprehensive and is designed to address a range of activities associated with an air compliance inspection. Since every inspection may not include all these activities, the

inspector should use those parts of the manual applicable to the particular inspection. A detailed table of contents is included to facilitate locating the pertinent sections of the manual.

It is currently planned that revised or additional material will be developed for this manual. It is anticipated that much of this material will be additional technical procedures for control device evaluation and policy revisions. These updates will be available through the Stationary Source Compliance Division (EN-341), U. S. Environmental Protection Agency, 401 M Street, S. W., Washington, DC 20460. The revised or additional pages will be identified such that insertion into the existing manual can be easily accomplished.

1.0 OVERVIEW AND INTRODUCTION

The Clean Air Act (CAA), as written in 1970 and amended in 1977, was passed "to protect and enhance the quality of the Nation's air resources so as to promote the "public health and welfare and the productive capacity of its population." More specifically, the CAA provides the U. S. Environmental Protection Agency (EPA) with the broad responsibility and authority to implement a federal program to achieve these goals through (1) the institution of a research and development program, and (2) the provision of technical and financial assistance to State and Local governments who are ultimately charged with the primary responsibility for the prevention and control of air pollution at its source. A copy of the Act (42 U. S.C. 7401 et seq.) is reproduced in Appendix A.

A major element in the prevention and control of air pollution at its source has been the development and adoption of standards and regulations designed to limit the emissions of pollutants from stationary sources. These standards and regulations were written and adopted based on stipulations of the Clean Air Act and fall into three categories:

- State-adopted EPA-approved State Implementation Plan (SIP) requirements adopted to meet national ambient air quality standards (Section 110 of CAA);

- Standards of Performance for New Stationary Sources (Section 111 of CAA) which are federally-promulgated and can be state-delegated; and

- Hazardous air pollutant standards (Section 112 of CAA) which are also federally promulgated and can be state-delegated.

Clearly an obligation closely associated with the adoption of such regulations is ensuring that the facilities affected by the regulations <u>first</u> attain initial compliance and then, continue to comply with these regulations.

Collecting compliance related information is referred to as compliance monitoring; this information is used to determine compliance of sources, identify sources which may be in violation, and to provide evidence to support enforcement of violations. The primary method of compliance monitoring is the on-site inspection. This manual outlines the basic administrative and technical procedures necessary to complete an informative, accurate, and legally sound air compliance inspection. In addition, it addresses other topics relevant to the on-site inspection and compliance monitoring including the basis for the on-site inspection, the selection or targeting of sources for inspection, recordkeeping and reporting reviews, inspection safety, inspection related aspects of the compliance test observation, and technical inspection procedures. As explained in more

detail in the Foreward, the technical inspection procedures presented emphasize inspection of particulate emission sources and control devices. Inspection procedures for other types of control devices and emission sources is currently outside the scope of this manual. However, the basic approach for all types of sources is the same. It is planned that future updates to the manual will contain procedures specific to the inspection of sources of other regulated pollutants.

To perform the most complete and informative inspection, the field inspector should have an adequate perspective on (1) the full authority of EPA and states to conduct on-site inspections, (2) the regulations with which the inspection aids in determining compliance, and (3) the personal responsibilities and liabilities of the inspector as an individual. The remainder of this first chapter addresses these topics. Chapter 2 discusses in detail the purpose of the EPA compliance inspection, source selection, inspection complexity, and alternatives to the on-site inspection for compliance monitoring.

1.1 LEGAL AUTHORITY FOR INSPECTIONS

Section 114 of the Clean Air Act provides the Administrator of EPA or his authorized representative with the authority, upon presentation of his credentials, to enter the premises of facilities subject to regulations under the Act to conduct on-site inspections to monitor compliance with these regulations.

1.1.1 Scope

Inspections conducted under Section 114 extend to all things relating to compliance with the requirements of the Clean Air Act which are within the premises being inspected. These may include:

- Records;
- Files;
- Processes;
- Monitoring equipment;
- Controls;
- Sampling methods; and
- Emissions.

1.1.2 State Authority

In accord with the intent of the Clean Air Act, much of the compliance monitoring, including on-site inspections, is accomplished at the state level. Section 114 of the Act provides for the extension of Federal authority to the States to carry out that Section. Where a State has been delegated Section 114 authority from EPA, the same authority EPA has to monitor, sample, inspect or copy records, and any other authority under Section 114 can, in like manner, be exercised by the State. No representative of EPA need accompany the State officials.

1.1.3 Authorized Representatives

EPA does not always have the manpower resources available to conduct all of the compliance monitoring functions on its own. In order to accomplish these functions, EPA frequently hires private contractors to provide technical support for on-site inspections and sampling, among other things. EPA maintains that such contractors upon proper designation are "authorized representatives" of the Administrator within the meaning of Section 114; however, the courts have not unanimously upheld EPA's position. For this reason, EPA has adopted a policy that duly-authorized contractors are only used to conduct on-site inspections in those Circuits where Court of Appeals decisions have not been against the use of contractors as authorized representatives.

EPA's current policy on the use of contractors to conduct on-site inspections is as follows:[1]

- First, Second, Third, Fourth, Fifth, Seventh, Eighth, Eleventh, and District of Columbia Circuits. Authorized contractors may be designated to provide technical support for inspections of facilities owned by anyone other than Stauffer Chemical Company.

- Ninth Circuit. Authorized contractors may be designated to provide technical support for any inspections.

- Sixth and Tenth Circuits. Absent express permission from Headquarters, authorized contractors should not be designated to provide technical support for any inspections.

1.1.4 Off-Site Inspections

EPA also has the authority to conduct unannounced, off-the-premises inspections, such as visible emission observations.

1.2. SCOPE OF REGULATIONS UNDER THE CLEAN AIR ACT

Basic to an overall understanding of the air compliance inspection and the procedures (and policies) involved is the understanding of the regulations under which compliance is determined and/or the inspection is conducted. As outlined by the Clean Air Act, the regulations affecting stationary sources of air pollution are part of three basic areas:

(1) state implementation plan (SIP) requirements,
(2) new source performance standards (NSPS), and
(3) national emission standards for hazardous air pollutants (NESHAPs).

Two other major elements under the CAA also have a significant effect on the regulation of emissions from stationary sources and should be noted by the inspector. These are:

(1) Prevention of Significant Deterioration (PSD), and
(2) Provisions for Non-Attainment Areas (NAA).

1.2.1 National Ambient Air Quality Standards

Because Congress recognized the interstate nature of air pollution, the EPA was charged with the responsibility of establishing uniform national ambient air quality standards (NAAQS) to assure consistency in protecting the inhabitants of all states. These standards were set for the so-called "criteria" pollutants, those pollutants which the Administrator identified as widespread (emitted by numerous or diverse mobile and stationary sources) and endangering public health and welfare. The name "criteria" pollutants comes from the fact that the CAA (Section 108) requires the EPA to issue Air Quality Criteria Documents for each pollutant identified as described above and hence occasions to an ambient air quality standard. These documents address air pollutant concentrations, exposure times, pollutant interactions, atmospheric variables, and any other factors which produce with the criteria pollutant itself kinds and degrees of damage to human health or welfare. The EPA is also responsible for preparing a parallel Control Techniques Document. This Document addresses "state of the art" emission control techniques for the criteria pollutant including cost of installation and operation, energy requirements, emission reduction benefits, and environmental impact.

Through the end of 1983 the EPA had identified seven criteria pollutants and promulgated national ambient air quality standards for each of the seven: particulate matter, sulfur oxides, nitrogen oxides, carbon monoxide, hydrocarbons (revoked in January 1983), ozone, and lead. Standards for all the pollutants are shown in Table 1-1.

To attain and subsequently maintain the NAAQS, each state was required to adopt and submit to EPA a plan providing for the implementation, maintenance, and enforcement of the standards over the entire state. Each State Implementation Plan (SIP) includes many provisions for attaining the primary and secondary NAAQS; however, a major portion of each plan is devoted to emission limitations and other regulations and programs to prohibit stationary sources from "emitting any air pollutant in amounts which will prevent attainment with the NAAQS or interfere with measures to prevent significant deterioration of air quality" (see Part C of Title 1 of CAA). Thus, each state directs its control regulations towards its unique set of sources and circumstances as long as the end result will be attainment of the NAAQS in the required time frame.

1.2.2 New Source Performance Standards

The New Source Performance Standards (NSPS)[2] apply to new, modified, and reconstructed stationary sources of air pollution. These standards are required under Section 111 of the Clean Air Act and take advantage of new source construction for the integration and application of advanced control technology thus avoiding the difficulties and extreme costs associated with retrofitting existing sources.

The source categories affected by these standards are those which have been identified by the EPA as emitting one or more pollutants in quantities significant enough to endanger the public health or welfare. Under NSPS

TABLE 1-1. NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Physical Form	Averaging Time	Primary Standards[a]	Secondary Standards[b]
Particulate Matter[d]	Particulate	Annual Geometric Mean	75 $\mu g/m^3$	60 $\mu g/m^3$
		24 hours[c]	250 $\mu g/m^3$	150 $\mu g/m^3$
Sulfur Dioxide	Gaseous	Annual Arithmetic Mean	80 $\mu g/m^3$ (0.03 ppm)	--
		24 hours[c]	365 $\mu g/m^3$ (0.14 ppm)	--
		3 hours[c]	--	1300 $\mu g/m^3$ (0.5 ppm)
Nitrogen Dioxide	Gaseous	Annual Arithmetic Mean	100 $\mu g/m^3$ (0.05 ppm)	Same as Primary Standard
Carbon Monoxide	Gaseous	8 hours[c]	10 mg/m^3 (9 ppm)	Same as Primary Standard
		1 hour[c]	40 mg/m^3 (35 ppm)	Same as Primary Standard
Ozone	Gaseous	1 hour[c]	235 $\mu g/m^3$ (0.12 ppm)	Same as Primary Standard
Lead	Particulate	Monthly[c]	1.5 $\mu g/m^3$	--

[a]The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[b]The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects.

[c]Not to be exceeded more than once per year.

[d]Proposed revision to standard for particulate matter will impose a limitation only on particles less than 10μm in diameter.

these categories must either (1) achieve the degree of emission limitation or percentage reduction, or (2) apply a design, equipment, work practice, operational standard, or combination which reflects the best available technological system of continuous emission reduction (considering cost and non-air quality impacts). Examples of control methods currently in use under the New Source Performance Standards are:

- Control equipment (e.g., electrostatic precipitators, fabric filters, wet scrubbers),
- Fuel selection based on emission characteristics,
- Precombustion cleaning or treatment of fuels,
- Use of a production process which is inherently low polluting or nonpolluting, and
- Use of particular work practices and/or operational standards so as to decrease emissions.

Source categories for which EPA has promulgated New Source Performance Standards are presented in Table 1-2.

1.2.3 National Emission Standards for Hazardous Air Pollutants

The National Emission Standards for Hazardous Air Pollutants (NESHAPs) are federally promulgated under Section 112 of the Clean Air Act. They cover air pollutants (noncriteria) which are not covered by ambient air quality standards. These pollutants are not covered by ambient air quality standards because they generally cause only localized problems, but are covered by emission standards because they cause or contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness.

Any source constructed or modified subsequent to the promulgation of an applicable hazardous air pollutant standard must in some manner meet the standard. Existing sources (those constructed prior to the promulgation of any of these standards) have 90 days after the standard is promulgated to comply (extensions may be granted).

These regulations may take the form of an emission standard or, if an emission standard is not feasible, a design, equipment, work practice, or operational standard. Unlike the New Source Performance Standards, although cost may be considered in setting a standard, consideration of cost is not explicitly required by Section 112.

The EPA has currently promulgated NESHAPs for five pollutants: asbestos, benzene, beryllium, mercury, and vinyl chloride and equipment leaks of volatile organic compounds. Standards have been proposed for an additional two pollutants: radionuclides and arsenic. The affected facilities and effective dates for each promulgated standard are summarized in Table 1-3.

TABLE 1-2. NSPS SOURCE CATEGORIES

Subpart[a]	Source Category	Year of Promulgation[b]
D	Fossil Fuel-Fired Steam Generators	1971
Da	Electric Utility Steam Generating Units constructed after September 18, 1978	1979
E	Incinerators	1971
F	Portland Cement Plants	1971
G	Nitric Acid Plants	1971
H	Sulfuric Acid Plants	1971
I	Asphalt Concrete Plants	1974
J	Petroleum Refineries	1974
K	Storage Vessels for Petroleum Liquids	1974
Ka	Storage Vessels for Petroleum Liquids constructed after May 18, 1978	1980
L	Secondary Lead Smelters	1974
M	Secondary Brass and Bronze Plants	1974
N	Iron and Steel Plants	1974
O	Sewage Treatment Plants	1974
P	Primary Copper Smelters	1976
Q	Primary Zinc Smelters	1976
R	Primary Lead Smelters	1976
S	Primary Aluminum Reduction Plants	1975
T	Phosphate Fertilizer Plants	1975
U	Super Phosphoric Acid Plants	1975
V	Diammonium Phosphate Plants	1975
W	Triple Superphosphate Plants	1975
X	Granular Triple Superphosphate Storage Facilities	1975
Y	Coal Preparation Plants	1976
Z	Ferroalloy Production Facilities	1976
AA	Steel Plants: Electric Arc Furnaces	1975
AAa	Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels	1984
BB	Kraft Pulp Mills	1978

(Continued)

TABLE 1-2. NSPS SOURCE CATEGORIES (continued)

Subpart[a]	Source Category	Year of Promulgation[b]
CC	Glass Manufacturing Plants	1980
DD	Grain Elevators	1978
EE	Surface Coating of Metal Furniture	1982
GG	Stationary Gas Turbines	1979
HH	Lime Manufacturing Plants	1978
KK	Lead-Acid Battery Manufacturing Plants	1982
LL	Metallic Mineral Processing Plants	1984
MM	Automobile and Light-Duty Truck Surface Coating Operations	1980
NN	Phosphate Rock Plants	1982
PP	Ammonium Sulfate Manufacture	1980
QQ	Graphic Arts: Rotogravure Printing	1982
RR	Pressure Sensitive Tapes and Labels	1983
SS	Surface Coating of Large Appliances	1982
TT	Metal Coil Surface Coating	1982
UU	Asphalt Roofing Manufacture	1982
VV	Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry	1983
WW	Beverage Can Surface Coating	1983
XX	Bulk Gasoline Terminals	1983
FFF	Flexible Vinyl and Urethane Coating and Printing	1984
GGG	Equipment Leaks of VOC in Petroleum Refineries	1984
HHH	Synthetic Fiber Production Facilities	1984
JJJ	Petroleum Dry Cleaners	1984

[a]Indicates Subpart of 40 CFR Part 60 - Standards of Performance for New Stationary Sources.

[b]Year of promulgation of standard; dates of revisions are not listed.

TABLE 1-3. NESHAP SUMMARY

Subpart[a]	Pollutant	Affected Facilities	Year of Promulgation[b]
C	Beryllium	Extraction Plants Ceramic Plants Foundries Incinerators Propellant Plants Machine Shops	1973
D	Beryllium (Rocket Motor Firing)	Rocket Motor Test Sites Closed Tank Collection of Combustion Products	1973
E	Mercury	Ore Processing Chlor-Alkali Manufacture Sludge Driers or Incinerators	1973
F	Vinyl Chloride	Ethylene Dichloride Manufacture Vinyl Chloride Manufacture Polyvinyl Chloride Manufacture	1976
J	Equipment Leaks (Fugitive Emission Sources) of Benzene	Pumps Compressors Pressure Relief Devices Sampling Connection Systems Open-ended Valves or Lines Valves Flanges and Other Connectors Product Accumulator Vessels Control Devices or Systems	1984
M	Asbestos	Asbestos Mills Roadway Surfacing Manufacturing of Asbestos Containing Products Demolition and Renovation Spraying Friable Asbestos Fabricating Friable Insulating Materials Waste Disposal Waste Disposal Sites	1984

(continued)

TABLE 1-3. NESHAP SUMMARY (continued)

Subpart[a]	Pollutant	Affected Facilities	Year of Promulgation[b]
V	Equipment Leaks (Fugitive Emission Sources)	Pumps Compressors Pressure Relief Devices Sampling Connection Systems Open-ended Valves or Lines Valves Pressure Relief Devices Flanges and Other Connectors Product Accumulator Vessels Closed Vent Systems Control Systems	1984

[a]Indicates Subpart of 40 CFR Part 61 - National Emission Standard for Hazardous Air Pollutants.

[b]Year of promulgation of standard; dates of revisions are not listed.

1.2.4 Prevention of Significant Deterioration

The program for Prevention of Significant Deterioration (PSD) is implemented under Part C of the CAA. Its purpose is to avoid significant future degradation of the nation's clean air areas. A clean air area is one where the air quality is better than the ambient primary or secondary standard. Designation is pollutant specific so that an area can be nonattainment for one pollutant, but clean for another. PSD applies only to new and modified sources in clean air areas. Clean air areas are divided into 3 categories:

- Class I - only minor air quality degradation allowed;
- Class II - moderate degradation; and
- Class III - substantial degradation.

In no case would PSD allow air quality to deteriorate below secondary air quality standards.

"Increments" are the maximum amount of deterioration that can occur in a clean air area over baseline. "Baseline" is the existing air quality for the area at the time the first PSD application is made. Increments in Class I areas are smaller than for Class II, and Class II increments are smaller than Class III areas. For purposes of PSD, a major emitting source is one of 26 designated categories which emits or has the potential to emit 100 tons/year of the designated air pollutant. A source that is not within the 26 designated categories is a major source if it emits more than 250 tons/year. The 26 designated categories are listed in Table 1-4.

New sources subject to PSD requirements must obtain permits before construction. This process requires that extensive data be assembled. The permit describes the level of control to be applied and what portion of the increment may be made available to that source by the State.

1.2.5 Provisions for Nonattainment Areas

Requirements affecting stationary sources planned for nonattainment areas are found in Part D of the CAA. Nonattainment areas are those which are not in compliance with National Ambient Air Quality Standards. New construction in a NAA is prohibited unless the SIP has been amended and approved by the EPA to reflect the following conditions:

- Total allowable emissions for the area will be less than emissions from existing sources.
- The new source must comply with the lowest achievable emission rate (LAER).
- All other sources within the State owned by the subject Company are in compliance.
- The SIP is being carried out for the area.

TABLE 1-4. PSD MAJOR EMITTING SOURCE CATEGORIES

Fossil-fuel fired steam electric plants (>250 MM/Btu/hr)
Coal cleaning plants
Kraft pulp mills
Portland cement plants
Primary zinc smelters
Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators (>250 tons/refuse/day)
Hydrofluoric acid plants
Nitric acid plants
Sulfuric acid plants
Petroleum refineries
Lime plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters
Fuel conversion plants
Sintering plants
Secondary metal production facilities
Chemical process plants
Fossil-fuel boilers (>250 MM Btu/hr)
Petroleum storage and transfer facilities (capacity >300,000 barrels)
Taconite ore processing facilities
Glass fiber processing plants
Charcoal production facilities

The applying source in an NAA must therefore obtain a greater than 1:1 reduction of the pollutant or pollutants for which the area has been designated nonattainment. The source must undergo a relatively stringent pre-construction review.

Emission offsets from existing sources may need to be obtained especially if the new source will have emissions that would exceed the allowance for the NAA. In these situations, the source would need to obtain enforceable agreements from other sources in the NAA or from its own plant in the NAA.

Emission reductions can also be "banked" by an existing source to permit future new source growth. Banked offsets may be sold or traded to other sources. Rules are yet to be established by the States governing the sale or trade of these banked offsets.

1.3 INSPECTOR RESPONSIBILITIES AND LIABILITIES 4,5,6

The primary role of the air compliance inpsector is to gather information needed in the determination of compliance with applicable regulations and relevant to other enforcement related activities, such as case development. Closely coupled with the accomplishment of these functions are certain responsibilities of the air compliance inspector, which include: (1) knowing and abiding by the legal requirements of the inspection, (2) using proper procedures for effective inspection and evidence collection, (3) practicing accepted safety procedures, (4) maintaining certain quality assurance standards, and (5) observing the professional and ethical responsibilities of the government employee. An additional important consideration for the inspector are any potential liabilities of his position.

1.3.1 Legal Responsibilities

It is essential that all inspection activities be conducted within the legal framework established by the Clean Air Act. In particular, this includes:

- Proper handling of confidential business information;
- Presentation of proper credentials and plant entry at reasonable times;
- Protection of the company's and its personnel's legal rights under the U. S. Constitution;
- Knowledge of all applicable statutes, regulations, and permit conditions; and
- Use of notice(s) and receipts, if appropriate.

1.3.2 Procedural Responsibilities

The inspector must be familiar with and adhere to, when possible, all general inspection procedures and evidence gathering techniques. This will ensure accurate inspections and avoid the possibility of endangering a legal proceeding on procedural grounds.

- Inspection Procedures - Inspectors should observe standard procedures for conducting each portion of the inspection, when possible. All deviations should be clearly documented. The accepted general inspection procedures are covered in detail in Chapter 3.0 of this manual.

- Evidence Collection - Inspectors must be familiar with general evidence gathering techniques. Because the government's case in a civil or criminal prosecution depends on the evidence gathered by the inspector, it is imperative that the inspector keep detailed records of each inspection. These records will serve as an aid in preparing the inspection report, in determining the appropriate enforcement response, and in giving testimony in an enforcement case. Documentation of evidence is covered in Chapter 3.0. Several responsibilities involved in evidence collection and presentation should be addressed here. Specifically, inspectors must:

  - Know how to substantiate facts with items of evidence, including samples, photographs, document copies, statements from persons, and personal observations.

  - Know how to detect lack of good faith during interviews with company personnel.

  - Be familiar with all applicable regulations and know what type of information is required to determine compliance with each.

  - Be able to evaluate what documentation is necessary (routine inspection).

  - Collect evidence in a manner that will be incontestable in legal proceedings.

  - Be able to write clear, informative inspection reports.

  - Know how to testify in court and at administrative hearings.

1.3.3 Safety Responsibilities

The inspection of air pollution control equipment and related work in other areas of industrial facilities generally involves potential exposure to numerous hazards. The inspector must, at all times, avoid putting him/herself or any plant personnel at unnecessary risk. To accomplish this, it is the inspector's responsibility to:

- Know and observe all plant safety requirements, warning signals, and emergency procedures.

- Know and observe all agency safety requirements, procedures, and policies.

- Remain current in safety practices and procedures by regular participation in agency safety training.

- Use any safety equipment required by the facility being inspected in addition to that required by the agency.

- Use safety equipment in accordance with agency guidance and labeling instructions.

- Maintain safety equipment in good condition and proper working order.

- Dress appropriately for each inspection activity, including protective clothing, if appropriate.

Chapter 5.0 of this manual and listed references address inspection safety procedures and other safety related questions in more detail.

1.3.4 Professional and Ethical Responsibilities

As professionals and employees of the Federal government, inspectors are expected to perform their duties with the highest degree of honesty and professionalism. Procedures and requirements ensuring ethical actions have been worked out through many years of governmental inspection activities. These procedures and standards of conduct have evolved for the protection of the individual and the Agency, as well as industry. The inspector is constantly in a position to set an example for private industry and to encourage concern for the health and safety in environment and compliance with the laws that protect them.

Specifically, the inspector should always consider and observe the following responsibilities:

- U. S. Constitution. All investigations are to be conducted within the framework of the United States Constitution and with due regard for individual rights regardless of race, sex, creed, or national origin.

- EPA Employee Conduct. Inspectors are to conduct themselves at all times in accordance with the regulations prescribing EPA Employee Responsibilities and Conduct, codified in 40 CFR Part 60, Part 3.

- Objectivity. The facts of an investigation are to be developed and reported completely, accurately, and objectively. In the course of an investigation, any act or failure to act motivated by reason of

private gain is illegal. Actions which could be construed as such should be scrupulously avoided.

- Knowledge. A continuing effort to improve professional knowledge and technical skill in the investigative field should be made. The inspector should keep abreast of changes in the field of air pollution, including current regulations, EPA and other agency policies, control technology, methodology, and safety considerations.

- Professional Attitude. The inspector is a representative of EPA and is often the initial or only contact between the Agency and industry. In dealing with facility representatives and employees, inspectors must be dignified, tactful, courteous, and diplomatic. They should be especially careful not to infringe on union/company agreements. A firm but responsive attitude will help to establish an atmosphere of cooperation and should foster good working relations. He should always strive to obtain the respect of, inspire confidence in, and maintain good will with industry and the public.

- Attire. Inspectors should dress appropriately, including wearing protective clothing or equipment, for the activity in which they are engaged.

- Industry, Public, and Consumer Relations. All information acquired in the course of an inspector's duties is for official use only. Inspectors should not speak of any product, manufacturer, or person in a derogatory manner.

- Gifts, Favors, Luncheons. Inspectors should not accept favors or benefits under circumstances that might be construed as influencing the performance of governmental duties. EPA regulations provide an exemption whereby an inspector could accept food and refreshment of nominal value on infrequent occasions in the ordinary course of a luncheon or dinner meeting or other meeting, or during an inspection tour. Inspectors should use this exemption only when absolutely necessary.

- Requests for Information. EPA has an "open-door" policy on releasing information to the public. This policy aims at making information about EPA and its work freely and equally available to all interested individuals, groups, and organizations. In fact, EPA employees have both a legal and traditional responsibility for making useful educational and safety information available to the public. This policy, however, does not extend to information relating to the suspicion of a violation, evidence of possible misconduct, or confidential business information.

1.3.5 Quality Assurance Responsiblities

The inspector assumes primary responsibility for ensuring the quality of data generated as a result of the inspection. He should thus adhere to quality assurance procedures appropriate to the type of data being generated. In general, quality assurance procedures are developed towards the following elements:

- Valid data collection;
- Approved, standard methods;
- Control of service, equipment, supplies;
- Quality analytical techniques; and
- Standard data handling and reporting.

1.3.6 Potential Liabilities

In this section concerning inspector responsibilities, mention might also be made of potential personal liabilities of the inspector. Althoughthese liabilities are not overwhelming, they definitely deserve consideration. Some examples of more prevelant liabilities are listed below. The inspector should consult his/her supervisor or agency legal staff for exact legal determinations on personal liability.

- Confidential Business Information - Under Section 1905 of Title 18 of the United States Code, Federal employees can be fined, imprisoned, or both for disclosure of confidential business information.

- Waivers, Visitor Releases - Some company's waivers or visitor releases, if signed, may purport to make the person signing liable for certain acts he or she might commit on plant property. These must never be signed by the inspector.

- Authority - In some cases, the inspector could be held liable for actions committed while acting beyond his/her authority; the inspector must always know exactly what his/her authority is.

1.4 REFERENCES

1. Clean Air Act Compliance/Enforcement Guidance Manual. Draft, 1984.

2. Code of Federal Regulations. Title 40, Part 60. Standards of Performance for New Stationary Sources, revised as of July 1, 1983.

3. Code of Federal Regulations. Title 40, Part 61. National Emission Standards for Hazardous Air Pollutants, revised as of July 12, 1982.

4. Multi-Media Compliance Audit Inspection Procedures. National Enforcement Investigations Center. Denver, Colorado. Office of Enforcement, U.S. Environmental Protection Agency. February 1983.

5. Toxic Substances Control Act Inspection Manual. Pesticides and Toxic Substances Enforcement Division. U.S. Environmental Protection Agency. January 1983.

6. The National Pollutant Discharge Elimination System (NPDES) Compliance Inspection Manual. Office of Water Enforcement and Permits. U.S. Environmental Protection Agency. October 1983.

2.0 COMPLIANCE MONITORING AND THE ON-SITE INSPECTION

As previously mentioned, the on-site inspection is the fundamental compliance monitoring technique used in EPA and State air compliance/enforcement programs. This chapter examines a number of subjects related to the execution of the on-site inspection or the on-site inspection itself. In particular, the following topics are addressed:

- Function of the EPA/State on-site inspection;
- Selection or targeting of sources for inspection;
- Inspection complexity; and
- Alternatives to the on-site inspection.

2.1 FUNCTION OF THE ON-SITE INSPECTION

On-site inspections perform a number of functions in the air compliance effort. The most important of these are:

- They are used to gather compliance data to determine or confirm compliance with regulations.
- They are used to identify violations.
- They are used to establish the basis for an enforcement action through documentation of a violation.
- They are a visible manifestation of the regulatory process and thus, tend to promote compliance.
- They provide informal consulting to assist a facility in identifying and resolving compliance problems.

The majority of on-site inspections conducted are routine compliance monitoring inspections. And, since the Clean Air Act puts the primary responsibility for control of air pollution with state and local governments, the majority of routine compliance inspections are performed by the State and local agencies. State and local agencies also conduct on-site inspections to collect evidence for enforcement actions.

EPA Regional Offices perform routine compliance inspections, but generally focus their efforts on conducting other types of inspections. The scope of the EPA inspection activities is outlined below:

- NSPS. EPA conducts routine inspections of NSPS sources in cases where the State agency has not been delegated the NSPS program.

- NESHAPs. EPA conducts routine inspections of NESHAPS sources in cases where the State agency has not been delegated the NESHAPS program.

- Certain SIPs. EPA conducts routine inspections of sources covered by EPA-promulgated State Implementation Plans.

- Oversight. EPA conducts overview inspections as a means to review the overall effectiveness of State efforts towards maintaining compliance of SIP and delegated NSPS and NESHAP sources.

- Known Violations. EPA conducts inspections to collect evidence of known violations in cases where a State agency is not responding in a "timely manner" or not responding at all.

- Overdue State Program. EPA conducts compliance inspections in cases where the State agency has not inspected a facility within the defined period (see Section 2.2).

- Inactive State Program. EPA conducts various types of inspections in cases where a State agency is not carrying out its compliance/enforcement related responsibilities.

2.2 SELECTION OR TARGETING OF FACILITIES FOR INSPECTION

As discussed in Chapter 1 Section 1.8, the Clean Air Act establishes the authority to perform an on-site inspection of a facility for the purpose of determining its compliance with regulations promulgated as a result of the Act. The selection or targeting of a facility for an on-site inspection is clearly an important part of the inspection process. Although not generally the responsibility of inspection personnel, facility selection or surveillance targeting involves a number of considerations of which the inspector should be aware.

The selection or targeting of sources for inspection is influenced in part by two Constitutional amendments.

- Fourth Amendment. This amendment protects sources against unreasonable searches.

- Fourteenth Amendment. This amendment provides the source with equal protection and "due process" of the law.

Under the Fourth Amendment, when a source refuses to consent to entry for the purposes of inspection and the agency must resort to using a search warrant, the warrant application must show either (1) "probable cause" or "reasonable suspicion" of a violation or (2) that the source was selected for inspection under a neutral inspection scheme. An agency must also be able to demonstrate these in the event that a source challenges an EPA inspection as being harassing. This was shown to be necessary by the Supreme Court decision in Marshall v. Barlow's, Inc., 436 U.S. 307 (1978).

The Fourteenth Amendment ensures that sources are not classified unreasonably. Thus, agencies must have a rational basis for treating similarly situated sources differently.

The result in terms of agency policy concerning surveillance targeting is that the agency must select sources for inspection by reasonable suspicion of a violation under the Clean Air Act or by a clearly documented neutral inspection scheme. And, the neutral inspection scheme must provide a rational basis for all source classifications.

In many instances, an EPA conducted inspection is done under reasonable suspicion of a violation. This occurs in cases where EPA is following up on a state-identified violation at their request or when the State has not made a timely and/or appropriate response in the case of suspected noncompliance.

In other instances EPA must utilize some type of neutral inspection scheme for source selection. These instances include planning overview inspections, and conducting inspections of non-delegated NSPS and NESHAPs sources. EPA might also use a neutral inspection scheme to target sources not inspected by a state which should be inspected. The following section outlines EPA's guidance on neutral inspection schemes.

2.2.1 Neutral Inspection Scheme

As a result of Barlow's decision, EPA issued the Regional Offices its first guidance for developing neutral inspection schemes. This guidance was in the form of a written framework for the selection of sources within each Region for periodic inspections and was entitled "Criteria for Selection of Stationary Sources for Routine Compliance Inspections."[1] These criteria (or a logical extension of them) were written to be utilized in source selection in each Regional Office and for presentation to the court in the event that a source challenges the inspection scheme or in the event that a warrant is needed to gain entry to a source for a routine inspection.

EPA's amended and most current guidance from a memo of May 13, 1981 is reproduced in Table 2-1[2]. Using this scheme, a source to be inspected must meet at least one of the Primary Criteria under point 1 and one of the Primary Criteria under point 2 and, in addition, must meet at least one of the Secondary Criteria. Any source not covered by the neutral inspection scheme is not be inspected unless there is a reasonable suspicion of a violation.

TABLE 2-1.
CRITERIA FOR SELECTION OF STATIONARY SOURCES
FOR ROUTINE COMPLIANCE INSPECTIONS

I. Sources subject to State Implementation Plans (including provisions approved or promulgated under 40 CFR 51.18 and Parts C and D of Title I of the Clean Air Act), or 111 of the Act (NSPS) or 112 of the Act (NESHAPS).

A. Primary Criteria

1. In selecting a stationary source for a compliance inspection, the source should be one which:

a. Emits an air pollutant subject to the Clean Air Act and the regulations promulgated thereunder, and for which:

1. The actual emissions or potential emissions while operating at design capacity with pollution controls are equal to or exceed 100 tons per year of the regulated air pollutant (Class A1 sources), or

2. The uncontrolled emissions while operating at design capacity are equal to or exceed 100 tons per year of the regulated air pollutant (Class A2 sources); or

b. Emits less than 100 tons per year of a regulated air pollutant in the absence of pollution controls (Class B sources) and which may contribute to nonattainment of an ambient air quality standard for that pollutant; or

c. Emits lead; or

d. Is subject to a NSPS or NESHAPS.

2. The source should also be one which:

a. Was reported within the preceding year by a State or local agency as being in compliance with applicable emission limits; or

b. Was either not inspected by a State or local agency or by EPA during the preceding year, or was subject to an inconclusive inspection during the preceding year.

(continued)

TABLE 2-1. (Continued)

B. Secondary Criteria

The following criteria (at least one) should be used in selecting facilities for inspection from among those which meet the Primary Criteria (and may be used by each Regional Office in any order it chooses and in a manner best suited to its resource, workload, manpower, and area of geographic responsibility):

Factor 1. Source emits a criteria pollutant and is located in a nonattainment area for that pollutant, or in an area unclassified for such pollutant;

Factor 2. Source has a significant impact upon local ambient air quality or emits a hazardous air pollutant;

Factor 3. Source is located in an urban area where there is greatest exposure of population;

Factor 4. Source has a history of violations and now is reported as in compliance;

Factor 5. Source has had frequent changes in compliance status;

Factor 6. Source has undergone process changes subsequent to its most recent inspection or has commenced initial operation;

Factor 7. Source requires particularly good operation and maintenance of pollution control or process equipment in order to maintain compliance;

Factor 8. Source is located near other sources which have been scheduled for inspection at approximately the same time in accordance with this Criteria for Selection of Stationary Sources for Routine Compliance Inspections or under probable cause to believe the source is in violation of the Clean Air Act;

Factor 9. Source was subject to a prior compliance test, inspection or information request which produced inconclusive data concerning its compliance status.

2.2.2 State and Local Government Methods for Selecting Sources for Inspection

State and local governments are subject to the same constraints in selection of sources for inspection as EPA. However, most State agencies must inspect many more sources on a routine basis than EPA. In addition, EPA has issued guidance to the states requiring certain categories of sources to be inspected with certain frequencies. Therefore, the states tend to have a more complex surveillance targeting problem.

In order to discuss surveillance targeting at the State (and local level) EPA's guidance on inspection frequency must first be addressed.

2.2.2.1 Inspection Frequency - Over the years EPA guidance to State and local agencies on inspection frequency has been evolving. Initially EPA specified, at least an annual inspection of each "major source" (source with an uncontrolled emission rate equal to or in excess of 100 tons per year of a regulated pollutant).

Revised inspection frequency guidance was issued in March 1980[3] as the result of a change in the definition of "major source" under the Clean Air Act. This guidance specified at least annual inspections of NSPS, NESHAPS, and Class Al SIP sources. Biennial inspection were specified for Class A2 SIP sources. These new source class definitions are shown below.

Major Sources

- Class Al Source - Stationary source whose actual or potential controlled emissions of any regulated pollutant equal or exceed 100 tons per year while operating at design capacity.

- Class A2 Source - Stationary source whose potential uncontrolled emissions of any regulated pollutant equal or exceed 100 tons per year while operating at design capacity.

Minor Sources

- Class B Source - Stationary source whose uncontrolled emissions of any regulated pollutant are greater than 25, but less than 100 tons per year.

Most recently EPA has proposed revised guidance on inspection frequency which seeks to balance the need for a nationally-uniform data base on facility compliance with the needs of State and local agencies to make optimal use of their limited resources. This revised guidance includes the following key points.

- Source Classification. All sources should be classified by applicable air program (SIP, NSPS, or NESHAPs) and by SIP class (Al, A2, B), if applicable. These classifications should be entered into EPA's Compliance Data System (CDS).

- Class A1 SIP Sources. All operating Class A1 SIP sources shall be inspected at least once every Federal fiscal year. Exceptions may be permitted if a source is constrained by an operating permit or is seasonal in nature; excepted sources shall be inspected once every five years.

- Class A2 SIP Sources. Operating Class A2 SIP sources shall be inspected biennially. A State may propose modifications if the overall scheme represents the same level of resource commitment and is more responsive to the needs of its air quality program. This might consist of any combination of additional Class A1 SIP inspections, Class A2 SIP inspections, and inspections of other regulated sources. The following conditions must be met:

  - SSCD must receive informational copies of such agreements at the start of each fiscal year.

  - A method of monitoring the agreement must be in place and data reporting requirements clearly established.

  - The State must demonstrate that the modified approach is based on at least the same resource expenditure as would be required to inspect all Class A2 SIP sources on a biennial basis.

  - All operating Class A2 SIP sources must be inspected at least once every five years.

- NSPS Sources. Any operating NSPS source which is also a Class A1 SIP source shall be inspected at least once every Federal fiscal year. All other NSPS sources shall be treated as Class A2 SIP sources.

- NESHAP Sources. All operating nontransitory NESHAP sources shall be inspected at least once every Federal fiscal year.

- On-site Inspection Alternatives. In some cases, continuous emission monitoring quarterly excess emission reports or fuel characteristics may substitute for an on-site inspection (see Section 2.4 for more detail).

2.2.2.2 Surveillance Targeting Techniques - Some type of surveillance targeting is a necessary activity in any air pollution program, particularly State programs. No program has the resources to inspect every source, so there must be a system to select sources for inspection and preferably one which targets sources in a manner which optimizes continuous compliance. In most cases, State surveillance targeting schemes combine the neutral inspection scheme, the EPA guidance on inspection frequency, and the selection of sources based on compliance history, citizen complaints, previous evidence of violation, etc. Since every State must design its own surveillance targeting plan based on State conditions such as source types, non-attainment areas, and agency resources, no one specific type of targeting plan will be discussed here. Instead, the remainder of this section defines and presents the various targeting factors, aids, and techniques currently in use at the State and local levels.[5]

Targeting Factors - A targeting factor is a consideration used by an agency in deciding whether a facility should be targeted for some type of surveillance action. The most commonly used targeting factors are:

- Source size
- Source location
  - Nonattainment areas
  - Rural versus urban
- Ambient impact
- Type of process and control equipment
- Type of pollutant
- Compliance history and attitude

Targeting Aids - A targeting aid is a mechanism used by an agency to assist it in the application of targeting factors. Typical targeting aids include:

- Citizen complaints
- Malfunction reports
- Excess emission reports
- Inspection reports
- Permit renewal applications
- Automated compliance data systems

Targeting Techniques - A targeting technique is the method by which targeting factors and aids are actually utilized. Typical targeting techniques include:

- The review of continuous emission monitoring (CEM) excess emission reports to determine whether certain sources with a greater probability of non-compliance require an on-site inspection.
- The review of malfunction reports for the same purpose.
- Use of an on-site inspection to determine whether CEM requirements are warranted or a more rigorous malfunction abatement plan is needed.
- Use of self-monitoring mechanisms as a principal targeting aid.

2.3 INSPECTION COMPLEXITY (LEVELS OF INSPECTION)

When a facility is selected (through whatever scheme) for an on-site inspection, the Agency must also decide the degree of complexity of the inspection. The degree of complexity of the inspection should reflect the degree of complexity of the facility, its control equipment, and its compliance history. Also considered are the precise objectives of the inspection.

The degree of complexity of the on-site inspection as is currently performed can be classified into four distinct levels. These levels of inspection are denoted 1 through 4 with the inspection complexity increasing with the level number. The inspection activities normally associated with each level are summarized below; detailed explanations of each level are provided in Section 8.1 of the chapter on inspection procedures for air pollution control systems.

Level 1 Inspection

- Unannounced, facility not entered.
- Visible emission observations.
- Fugitive emission observations.
- Odor conditions noted.
- Observation of facility operations, to extent possible.

Level 2 Inspection

- "Walkthrough" evaluation of emission source and/or control device.
- Visible emission observations.
- Data collection from and evaluation of process and control device instrumentation.
- Checks (from outside) of internal conditions of control devices (if shut down).
- Routine check of CEM (continuous emission monitor) data.
- Check of source-maintained records.
- Annual determination of continued operation and process throughput of sources that do not operate control equipment.*

*Previously referred to as a Level 0 Inspection.

Level 3 Inspection

- Portable instrumentation used to measure specific operating parameters such as pressure drop, gas stream temperature, flue gas oxygen and carbon dioxide level, gas stream velocity, and scrubber liquor pH.
- Check of process operating conditions.
- Detailed evaluation of CEM monitoring data.
- Raw material and fuel analysis.
- Visible emissions observations, where appropriate.
- Checks (from outside) of internal conditons of control devices (if shut down).
- Generally performed only on units with apparent problems.

Level 4 Inspection

- Similar in complexity to Level 3 inspection.
- Done in conjunction with a compliance test to document "representative" conditions and gather baseline data (see Chapter 7.0 Observing the Compliance Test and Chapter 8.0).
- For smaller sources, may be done during a period when source is believed to be in compliance and control device is working properly.

These alternatives in inspection complexity allow the agency (be it EPA or a State or local agency) to tailor the inspection to the facility and situation. This avoids wasted manpower and resources and allows a concentration of effort toward those sources which have the greatest potential to exceed emission limits. For example, a Level 3 inspection might reveal performance data indicating compliance with all regulations. Thus, a higher level of inspection would not be warranted. In fact, subsequent inspections of the same source might rationally be adjusted down to a lower level.

2.4 ALTERNATIVES TO THE ON-SITE INSPECTION

This section presents several alternatives to the on-site inspection for compliance monitoring.

These are:

- Continuous emission monitoring (and reporting);
- Fuel characteristics;
- Parameter monitoring;

- Environmental auditing; and

- Section 114 letters.

These alternatives vary greatly in their utilization and their degree of acceptance as methods which can be used to collect data for enforcement purposes. They are presented here only as background information for the inspector; detailed information on applicability, acceptability, and application of each alternative is available in other reports and publications.

2.4.1 Excess Emission Reports from Continuous Monitoring Programs

The U. S. EPA Stationary Source Compliance Division has indicated in a recently released draft guideline document[4] that compliance monitoring based on the use of excess emission reports (EERs) may be a suitable alternative to on-site inspections. Many sources are required to implement continuous monitoring programs which involve the application of continuous emission monitoring systems (CEMSs). These programs are directed at monitoring opacity, sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and total reduced sulfur (TRS) compounds. Depending on the specific regulations that apply to the source, the results afforded by CEMSs may be used by the control agency for purposes of assessing compliance with either (a) operation and maintenance requirements, or (b) emission standards. Sources affected by monitoring regulations are required to submit reports to the control agency on a quarterly basis; these reports are generally referred to as excess emission reports.

The information required in an EER is not restricted to excess emissions and thus indicates a range of source performance. For sources subject to New Source Performance Standards the required information falls into three potential categories:

- Source operation and performance;

- CEMS operation and performance; and

- Negative declaration (no excess emissions).

Items pertinent to source operation are identified within 40 CFR Part 60[9], paragraph 60.7 and reflect the following reporting requirements:

- "The magnitude of excess emissions... and the date and time of commencement and completion of each time period of excess emissions."

- "Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventive measures adopted."

- "When no excess emissions have occurred or the continuous monitoring system(s) [i.e., CEMS(s)] have not been inoperative, repaired, or adjusted, such information shall be stated in the report."

To a great extent the quality of the CEMS data determines the quality of the information pertaining to source operation and performance. Consequently, the usefulness of EERs to agencies is constrained by the quality of the source's monitoring program (which can be affected by the agency's approach to monitoring programs in general).

The effective use of EERs depends on the use of three general program elements:

- Recordkeeping and review;
- Periodic assessment of CEMS data quality; and
- Follow-up action.

Recordkeeping and review activities enable the agency to establish baseline performance data with respect to the source itself and to the source relative to sources in the category. Such information enables the control agency to establish source performance limits, and therefore, criteria for assessing whether on-site inspections are needed.

Periodic assessments of CEMS data quality are necessary to ensure that the control agency can accurately discriminate source performance from CEMS data. CEMS data quality can be assessed from the results provided by CEMS performance tests and audits.

Follow-up actions establish the agency's presence and demonstrate the clear intent to use the EERs for compliance monitoring. Actions can be at several levels, ranging from telephone contacts to requests for source performance testing to be conducted.

The draft guideline document[4] specifies certain criteria for the use of EERs as an alternative to on-site inspections; they are the following:

- The data reported in the EER to assess compliance are at least comparable to the data which would have been obtained during an on-site inspection to assess compliance.
- As part of the State's CEM quality assurance/quality control program, the monitor must be quantitatively audited at least every three years.
- EERs must be input into the CEM subset of CDS.
- The intended use of the EER alternative to on-site inspections must be agreed upon between the State and the EPA Regional Office.
- The Stationary Source Compliance Division must receive the names and CDS numbers of all Class A1 SIP and NSPS sources covered by the EER alternative to adjust properly the data base for subsequent analysis and reporting.

- The State must conduct an on-site inspection of all sources being tracked under the EER alternative at least once every three years. (This could be conducted in conjunction with the quantitative audit previously described.)

2.4.2 Fuel Characteristics

In some cases compliance of a combustion source may be based solely on the characteristics of the fuel burned. In these cases, a review of the fuel supplier's records and the sampling and appropriate analysis of the fuel being burned may substitute for the on-site inspection.[4]

2.4.3 Parameter Monitoring

The purpose of parameter monitoring is to reduce the number of routine Level 2 inspections which must be done by agency personnel. Industrial facilities agreeing to do parameter monitoring also benefit through improved air pollution control device performance data and less frequent agency inspections.

The agency and the source operator must reach agreement on the types of data necessary to evaluate performance and on the quality assurance procedures to be used in data acquisition and reduction. Then a baseline data set is compiled to aid in future evaluations. It is the responsibility of the source operators to maintain the control system in compliance with all applicable regulations and to submit the agreed upon data documenting this performance. Any malfunctions or control equipment failures must be reported to the regulatory agency within 12 to 24 hours.

Regulatory agencies must continue to perform Level 1 inspections to check on the adequacy of the parameter monitoring. For example, it is possible to have frequent short term excess emission incidents which could not be identified by control device monitoring instruments and continuous emission monitors. If such short term problems were identified or if the evaluation of the submitted data indicated a possible performance problem, a Level 3 inspection should be conducted by the agency. A Level 3 inspection should also be performed if the source fails to submit the agreed upon information on schedule.

Both parties should maintain applicable records. All raw data and strip charts used by the source operators should be maintained for a period of at least a year in a retrievable archive. Calculations used in data reduction and presentation should be maintained. The agency should also maintain a file which documents that a full evaluation of the submitted data has been performed upon receipt.

2.4.4 Environmental Auditing

The term environmental auditing refers to the use of internal management systems by a company to review facility operations and practices in order to assess and verify compliance with environmental regulations and corporate

policy. It can also be used to evaluate the effectiveness of environmental management systems already in place or assess environmental risks from regulated and unregulated materials and practices. Environmental auditing is currently in the primary stages of development as a tool for compliance monitoring.

Among the advantages of environmental auditing tool are:[6,7,8]

- Better environmental performance. Companies can more readily and effectively identify problems and determine compliance status since they know where to look, what to ask, and whom to question. The result is faster problem identification, more problem avoidance, and better compliance over time.

- Better use of limited agency resources. Effective environmental auditing systems could assist inspection and enforcement targetting.

- Better government/industry cooperation. Knowledge of what constitutes an effective environmental auditing system and which companies have effective systems can reduce the adversarial roles between government and industry, since government would have more confidence in such a company's ability and desire to meet environmental requirements without government intervention.

- Acquisiton of more information. Agencies are likely to acquire better compliance data, even without requiring industry to turn over their audit reports. Through enviromental audits companies may acquire and possibly share information on improved control technologies and techniques, better management systems, effective training, etc. In addition, audit generated information could result in significant improvements in monitoring reports, emissions inventories, and other data bases.

2.4.5 Section 114 Requests for Information

Section 114 of the Clean Air Act authorizes the EPA Administrator to require the owner or operator of an emission source subject to the Act to provide such relevant information as he requests. This is generally accomplished using what is referred to as a "Section 114 letter." Section 114 letters can serve as an alternative to the on-site inspection in cases when the on-site inspection is not cost effective or when the information obtained under the request eliminates the need for the inspection. Section 114 letters may also be used to supplement the on-site inspection by providing advance notification or by requesting information beforehand which will facilitate the inspection.

Information typically requested utilizing a Section 114 request includes:[9]

- Raw materials, products, by products, production levels;
- Facility layout maps identifying process equipment, control equipment, and emission points;
- Flow diagrams;
- Description and design of pollution control equipment and normal operating parameters;
- Recent self-monitoring reports such as fuel analyses and control equipment parameters;
- Description of self-monitoring equipment in use, normal operating levels, and types of data produced; and
- Copies of any records required to be kept under applicable regulations.

2.5 REFERENCES

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10. Memorandum on "Guidance on Timely and Appropriate EPA/State Enforcement Response for Significant Air Violators (June 28, 1984)," from the Assistant Administrator for Air and Radiation to Regional Administrators, Regions I-X. Office of Air and Radiation. U. S. Environmental Protection Agency. June 1984.

11. Code of Federal Regulations. Title 40, Part 60. Standards of Performance for New Stationary Sources, revised as of July 1, 1983.

3.0 GENERAL INSPECTION PROCEDURES

This chapter describes the administrative and legal procedures common to most air compliance inspections. These include procedures which help to ensure a complete and up-to-date technical inspection and those which ensure a legally sound inspection. These procedures result in the gathering of more appropriate and useful data which ultimately can be effectively used in compliance monitoring and determination, and enforcement actions if necessary.

These general inspection procedures can be grouped into categories according to the time they occur in the inspection process: (1) pre-inspection preparation, (2) pre-entry observations, (3) entry, (4) opening conference, (5) documentation, (6) closing conference, and (7) file update and report preparation. The general procedures under each category are covered in the sections which follow. In addition, special sections of this chapter are devoted to: (1) handling of confidential business information and (2) chain of custody procedures.

The procedures described are common to most compliance inspections. However, the emphasis given to any procedure or set of procedures will vary with the requirements of a particular inspection.

3.1 PRE-INSPECTION PREPARATION

Pre-inspection preparation is always necessary to ensure effective use of the inspector's time and the facility's time, and to ensure that the inspection is properly focused on collecting relevant data and information. This preparation involves:

- Review of facility background;
- Development of an inspection plan;
- Notifications; and
- Equipment preparation.

3.1.1 Review of Facility Background

A review of the available background information on the facility to be inspected is essential to the overall success of the inspection. The review should enable the inspector to become familiar with the facility's process and emission characteristics; conduct the inspection in a timely manner; minimize inconvenience to the facility by not requesting unnecessary data such as that

previously provided to the EPA or another agency; conduct an efficient, but thorough inspection; clarify technical and legal issues before entry; and prepare a useful inspection report. The following types of information should be reviewed.

Basic Facility Information

- Names, titles, and phone numbers of facility representatives.
- Maps showing facility location and geographic relationship to residences, etc. potentially impacted by emissions.
- Process and production information.
- Flowsheets identifying sources, control devices, monitors, and other points of interest.
- Safety equipment requirements.

Pollution Control Equipment and Other Relevant Equipment Data

- Description and design data for control devices and relevant process equipment.
- Sources and characterization of emissions.
- Continuous emission monitoring system(s) data.
- Previous inspection checklists (and reports).
- Baseline performance data for control equipment.

Regulations, Requirements, and Limitations

- Most recent permits for facility sources.
- Applicable Federal, State, and local regulations and requirements.
- Special exemptions and waivers, if any.
- Acceptable operating conditions.

Facility Compliance and Enforcement History

- Previous inspection reports.
- Complaint history including reports, follow-up, findings, remedial action.
- Past conditions of noncompliance.

- Previous enforcement actions.
- Pending enforcement actions, compliance schedules and/or variances.
- Self-monitoring data and reports.

The following are recommended sources for obtaining this background information.

- Inspector's "Working" File - The inspector's own concise file for a facility containing basic plant and process information, flowsheets, baseline performance data for control equipment and process equipment, chronology of enforcement related actions, recent permits, and safety equipment requirements.
- Regional Office Files and Data Bases - These files should include much of the information needed including inspection reports, permits and permit applications, compliance and enforcement history, exemption or waiver information, and some self-monitoring data.
- State/Local Files and Contacts - These should be used to supplement and update the information available in the Regional Office files.
- Laws and Regulations - The Clean Air Act and related regulations establish emission standards, controls, procedures, and other requirements applicable to a facility. State and local laws and regulations should also be considered.
- Technical Reports, Documents, and Guidelines - These can often be valuable in providing information and/or guidance concerning specific processes, control techniques, performance advantages and limitations of particular types of control equipment, and specific inspection procedures.

3.1.2 Development of an Inspection Plan

Based on the review of the facility background information and the intended purpose of the inspection, the inspector should develop an inspection plan. This plan should address the following items.

- Inspection Objectives - Identify the precise purpose of the inspection in terms of what it will accomplish.
- Tasks - Decide on the specific tasks which will accomplish the inspection objectives including the exact information which must be collected.
- Procedures - Determine the procedures to be used in completing the tasks, particularly special or unfamiliar procedures.
- Resources - Determine what equipment and personnel will be required.

- Schedule - Estimate the time requirements for the inspection; determine a reasonable time for the inspection (when plant is operating at representative conditions).

3.1.3 Notification of the Facility

EPA Regional offices vary in their exact policies concerning giving a facility advance notification of an inspection. In a recent EPA policy memo entitled "Final Guidance on Use of Unannounced Inspections," however, the Stationary Source Compliance Division recommends that all Regional inspection programs incorporate unannounced inspections as part of their overall inspection approach.[1] The advantages of the unannounced inspection are: (1) the opportunity to observe the source under normal operating conditions, since the source does not have time to prepare for the inspection; (2) detection of visible emissions and O&M-type problems and violations; (3) creation of an increased level of attention by a source to its compliance status; and (4) projection of a serious attitude toward surveillance by the Agency.

The potential negative aspects of performing unannounced inspections are: (1) the source may not be operating or key plant personnel may not be available and (2) there could be an adverse impact on EPA/State or EPA/source relations. However, it has been demonstrated by the Regional offices who already use the unannounced inspections that, in the majority of cases, these drawbacks can be overcome.

When using the unannounced inspection, an alternative to arriving at the source totally unannounced is to contact the source shortly before the scheduled inspection time. This is left to the discretion of the Regional office and/or the inspector and must be done so as not to alter the representativeness of the source operation. The amount of advanced notice given should be noted in the inspection report.

Announced inspections are performed by EPA and its authorized representatives when some specific purpose is served by providing such notice. Situations where announced inspections are appropriate are:

- When specific information is being sought which must be prepared by the source, or where the source must make significant accomodations for the inspector to gather the information;

- When the assistance of specific plant personnel is necessary for the successful performance of the inspections, i.e., the information they provide cannot be obtained from other on-duty plant personnel or by a follow-up information request;

- When inspecting government facilities or sources operating under government contract where entry is restricted due to classified operations; and

- When inspecting un-manned or extremely remote sources.

When the inspection is announced in advance, a lead time of five working days is generally appropriate. Notification may be by telephone or letter and it may or may not include the exact date and time of the inspection. Instances where written notification (instead of oral) is appropriate are:

- When requested by the State/local agency or by the source;
- When extensive or specific records are being sought;
- When the inspection is to be performed solely by an EPA contractor;
- When inspecting government facilities with classified operations or otherwise restricted entry; and
- Special-purpose inspections, e.g., to establish conditions for a source-specific SIP revision.

A "114 Letter" is sometimes used for notification if there is a need to request facility information prior to the inspection. The facility representative notified should have the authority to release data and samples and to arrange for access to specific processes. In addition, when notifying a facility on an inspection, information should be requested in regard to on-site safety regulations. This will avoid problems concerning safety equipment at the time of the inspection.

3.1.4 Notification of Responsible State Agency

State and/or local agencies should be given a minimum of five working days advance notice of unannounced or announced inspections to be conducted within their jurisdiction.[1] In the case of an announced inspection, this notification should precede that given to the source.

Notification can be written or oral; in any case, a record should be kept. The thorough notification and record thereof should include the following items:

- Name and location of subject facility;
- Date and approximate time of the activity;
- Regional Office contact (phone number, etc);
- Reason for the inspection;
- Name of the state contact; and
- Date and time of notification.

State/EPA Memorandums of Agreements should be consulted for further information on notification procedures.

3.1.5 Equipment Preparation

Part of the pre-inspection preparation involves obtaining and preparing inspection and safety equipment. The type of equipment may vary according to the inspection objectives, the level of inspection, and the process, control equipment, and safety requirements at the facility itself. A general list of recommended equipment is provided in Table 3-1.[3]

All equipment should be checked, calibrated, and tested before use. The inspector is responsible for seeing that all equipment necessary to conduct an inspection is brought to the inspection site.

Safety equipment required for a facility is based on the response to a "114 Letter" used for the inspection announcement or on the safety requirements for that facility previously recorded in the agency files. Safety requirements must be met, not only for safety reasons, but to ensure that the inspector is not denied entry to the facility or parts of it.

As previously stated, Table 3-1 shows a listing of standard inspection and safety equipment for air compliance inspections. It is recommended that those items necessary for the majority of inspections (Level 2) be carried in a portable case or tool belt pouch from emission point to emission point. The appropriate items from the list of "Equipment Required for Certain Inspections" (Level 3 and 4 and certain safety equipment not normally required) should be added to the equipment carried, or placed in a central location at the plant or in the inspector's car to be retrieved if needed.

Before or after equipment preparation, the inspector must also consider what written materials, forms, documents, etc. he/she will require during the inspection. These should also be gathered and organized before the inspection. These materials may include any or all from the following list.

- Maps
- Flowcharts
- Plant layout
- Applicable regulations
- Inspection checklists
- Field Notebook
- Reference materials
- Visible Emission Observation Forms
- Inspection plan or agenda
- EPA credentials
- Facility information
- Baseline data
- Information requested by facility

TABLE 3-1. RECOMMENDED INSPECTION AND SAFETY EQUIPMENT

Equipment Necessary for Most Inspections	Equipment Required for Certain Inspections
Hardhat	Respirator with appropriate cartridge(s)
Safety glasses or goggles	Velometer
Gloves	Pump and filter system
Coveralls	Bucket
Safety shoes	Manometer or differential pressure gauges
Ear protectors	Combustion gas analyzer
Tape measure	Thermometer or thermocouple
Flashlight	pH paper or pH meter
Stopwatch	Multimeter
Duct tape	Sample bottles
NIOSH/OSHA Pocket Guide to Chemical Hazards	Strobe
	Inductance ammeter
	Tachometer
	Oxygen and combustibles meter(s)
	Self-contained breathing equipment
	Rope

3.2 PRE-ENTRY OBSERVATIONS

Two types of observations, conducted prior to plant entry, have been shown to be valuable in the determination of facility compliance. These are the observation of the plant surroundings and the visible emission observation.

3.2.1 Plant Surroundings Observation

Observations of areas surrounding the plant before entering may reveal a variety of signs of operational practices and pollutant emissions which can aid in the pre-entry evaluation. These include:

- Obvious vegetation damage near the plant;
- Odors downwind of the plant;

- Deposits on cars parked closeby;
- Other signs of "dusting" downwind of the plant;
- Fugitive emissions near plant boundaries;
- Conditions around the product and/or waste storage piles;
- Conditions near lagoons and sludge ponds; and
- Proximity of source to potential receptors.

Some of the signs may indicate that fugitive emission sources should be added to the inspection plan. If odors are a problem, the weather conditions including wind direction should be noted for inclusion in the inspection report: once inside the plant, olfactory fatigue may (under certain circumstances) reduce the inspector's ability to detect these odors.

3.2.2 Visible Emissions Observation

In addition to observing the plant surroundings prior to entry, the inspector may also perform visible emission observations at that time. It is possible that not all emission points will be visible from a location outside the plant property lines, but those that are may be conveniently read before entry. Visible emission observation procedures are detailed in Chapter 6.0.

It is appropriate for the inspector to inform plant officials of excess visible emissions subsequent to their observation. At the same time he should find out what caused them; this gives them the opportunity to promptly evaluate, answer to, and correct the problem. There may be State statutes which require notification; the inspector should be aware of these before he visits the plant.

3.3 ENTRY

This section details the accepted procedures under the CAA for entry to a facility to conduct an on-site inspection. It does not provide detailed procedures for obtaining an inspection warrant in the case of refusal of entry, since refusal is not prevalent and this subject is covered in detail in other publications.

3.3.1 Authority

The Clean Air Act authorizes plant entry for the purposes of inspection. In specific, Section 114 of the Act states:[4]

> ".....the Administrator or his authorized representative, upon presentation of his credentials shall have a right of entry to, upon or through any premises of such person or in which any records required to be maintained..... are located, and may at

reasonable times have access to and copy any records, inspect any monitoring equipment or methods....., and sample any emissions which such person is required to sample....."

3.3.2 Arrival

Arrival at the facility must be during normal working hours. Entry through the main gate is recommended unless the inspector has been previously instructed otherwise. As soon as the inspector arrives on the premises he should locate a responsible plant official usually the plant owner, manager, or chief environmental engineer. In the case of an announced inspection this person would most probably be the official to whom notification was made. The inspector should note the name and title of this plant representative.

3.3.3 Credentials

Upon meeting the appropriate plant official, the inspector should introduce himself or herself as an EPA inspector and present the official with the proper EPA credentials and state the reason for requesting entry. The credentials provide the plant official with the assurance that the inspector is a lawful representative of the agency. Each office of the EPA issues its own credentials; most include the inspector's photograph, signature, his physical description, (age, height, weight, color of hair and eyes), and the authority for the inspection. Credentials must be presented whether or not identification is requested.[4] After facility officials have examined the credentials, they may telephone the appropriate EPA Office for verification of the inspector's identification. Credentials should never leave the sight of the inspector.

3.3.4 Consent

Consent to inspect the premises must be given by the owner, operator, or his representative at the time of the inspection. As long as the inspector is allowed to enter, entry is considered voluntary and consensual, unless the inspector is expressly told to leave the premises. Express consent is not necessary; absence of an express denial constitutes consent.[5]

3.3.4.1 Reluctance To Give Consent - The receptiveness of facility officials toward inspectors is likely to vary from facility to facility. Most inspections will proceed without difficulty. If consent to enter is flatly denied, the inspector should follow the procedures in Section 3.3.7 on Problems with Entry or Consent. In other cases, officials may be reluctant to give entry consent because of misunderstandings of responsibilities, inconvenience to a firm's schedule, or other reasons that may be overcome by diplomacy and discussion.

If there is difficulty in gaining consent to enter, inspectors should tactfully probe the reasons and work with officials to overcome the obstacles. Care should be taken, however, to avoid threats of any kind, inflammatory discussions, or deepening of misunderstandings. Whenever the

situation is beyond the authority or ability of the inspector, he should contact his supervisor for guidance.

3.3.4.2 Uncredentialed Persons Accompanying an Inspector - The consent of the owner or agent in charge must be obtained for the entry of persons accompanying an inspector to a site if they do not have specific authorization. If consent is not given voluntarily, these persons may not enter the premises. If consent is given, these persons may not view confidential business information unless officially authorized for access.

3.3.5 Waivers, Releases, and Sign-In Logs

When the facility provides a blank sign-in sheet, log, or visitor register, it is acceptable for inspectors to sign it. Under no circumstances should EPA employees sign any type of "waiver" or "visitor release" that would relieve the facility of responsibility for injury or which would limit the rights of the Agency to use data obtained from the facility.

If such a waiver or release is presented, the inspector should politely explain he/she cannot sign it and request a blank sign-in sheet. If an inspector is refused entry because they do not sign such release, they should leave and immediately report all pertinent facts to the appropriate supervisory and/or legal staff. All events surrounding the refused entry should be fully documented. Problems should be discussed cordially and professionally.

3.3.6 Nondisclosure Statements

Inspectors have, in the past, occasionally been asked to sign nondisclosure statements or agreements. These agreements vary slightly in content from one to another, but generally require that confidential information, disclosed to an inspector during the course of an inspection, be handled thereafter in a specified manner. An inspector should not sign such agreements since Federal Regulations (40 CFR Part 2, as amended) on the confidentiality of business information already protect the businesses from disclosure of confidential information.[6]

3.3.7 Problems with Entry or Consent

Because some facilities may consider inspections adversarial, the inspector may be challenged concerning the legal authority for the inspection techniques, and/or his competency. In all cases, the inspector must cordially explain the authority and the reasons for the protocols followed. If explanations are not satisfactory or disagreements are irresolvable, the inspector should leave and obtain further direction from the appropriate Agency supervisory or legal staff. Professionalism and politeness must prevail at all times.

3.3.7.1 Denial of Entry - The inspector must always gain entry to the premises of a facility and perform inspection activities with the consent of the owner. This is consistent with a company's right of privacy guaranteed by

the Fourth Amendment of the U. S. Constitution. If an inspector is refused entry into a facility for the purpose of an inspection under the Clean Air Act, certain procedures must be followed. These procedures have been developed in accordance with a 1978 U. S. Supreme Court decision [Marshal v. Barlow's Inc. 436 U. S. 307] which served to clarify a company's rights under the Fourth Amendment regarding entry by inspectors.[5]

1. Tactfully discuss the reason for denial with the plant official. This is to ensure that it has not been based on a misunderstanding of some sort. If resolution is beyond the authority of the inspector, he might suggest that the official seek advice from the company's attorneys on clarification of the EPA's authority for inspection under the Clean Air Act and State law.

2. The inspector should be very careful to avoid any situations that might be construed as threatening or inflammatory. Under no circumstances should he cite the potential penalties of entry denial.

3. The inspector should withdraw from the premises and contact his supervisor to decide on a subsequent course of action.

4. At the time of withdrawal, the inspector should note the facility name and exact address, the name and title of the plant officials approached, the authority of the person issuing the denial (he must be authorized), the date and time of denial, the reason for denial, facility appearance, and any reasonable suspicions as to why entry was refused. This information will be important should a warrant be sought.

3.3.7.2 Withdrawal of Consent During Inspection - If the plant official asks the inspector to leave the premises after the inspection has begun, the inspector should follow the procedures discussed in the previous section on Denial of Entry. The April 11, 1979 EPA "Memorandum on Inspection Procedures" confirms that all evidence gathered and activities performed prior to withdrawal of consent is considered valid.[5]

3.3.7.3 Denial of Access to Some Areas of Facility - If the inspector is denied access only to certain parts of a facility, he should make note of these areas and the circumstances surrounding the denial including the facility official's reason for denying access. The inspection should be completed to the extent allowed. After leaving the facility, the inspector should contact the appropriate Agency office for further instructions; this should include a determination of whether a warrant should be obtained to inspect the portions of the facility not seen.

3.3.8 Warrants

In the event that a plant official persists in refusing plant entry or withdraws consent during the course of an inspection, an administrative or criminal warrant may be used to gain entry into the plant. A warrant is a judicial authorization for an appropriate official to enter a specifically

described location and perform specifically described inspection functions. The inspector should always confer with his supervisor to determine that this course of action is the most appropriate.

There are two types of warrants: criminal and civil (or administrative) warrants. Administrative inspection warrants are the type most often sought in the case of plant entry denial; criminal search warrants are only used in cases where the inspection is intended, in whole or in part, to gather evidence for a possible criminal prosecution. To obtain a criminal search warrant, one must be able to demonstrate criminal probable cause which is based on whether a person of ordinary caution and prudence would be led to believe and conscientiously entertain a strong suspicion of a violation. Administrative warrants are issued upon the showing of (1) civil probable cause or (2) that the establishment was selected for inspection pursuant to a neutral administrative inspection scheme. Showing civil probable cause consists of demonstrating specific evidence of an existing violation. A neutral or reasonable inspection scheme would include schemes such as annual inspections of sources covered by a specific type of permit. Detailed procedures for obtaining a warrant are available in Reference 2.

3.4 OPENING CONFERENCE

Once legal entry has been established, the inspector should proceed with a vital part of every inspection, the opening conference. The purpose of the opening conference is to inform the facility official(s) of the purpose of the inspection, the authorities under which it will be conducted, and the procedures to be followed. The opening conference also offers the inspector the opportunity to strengthen Agency - industry relations through a positive attitude and providing relevant information and other assistance. The effective execution of the opening conference on the inspector's part often facilitates the remainder of the inspection.

During the opening conference, the inspector is responsible for covering the following items.

- Inspection Objectives. An outline of inspection objectives will inform facility officials of the purpose and scope of the inspection and may help avoid misunderstandings.

- Inspection Agenda. Discussion of the sequence and content of the inspection including operations and control equipment to be inspected and their current operating status. This will help eliminate wasted time by allowing officials time to make any preparations necessary. The types of measurements to be made and the samples to be collected (if any) should also be addressed.

- Facility Information Verification. The inspector should verify or collect the following information:

  - Correct name and address of facility;
  - Correct names of plant management and officials;
  - Principal product(s) and production rates;
  - Sources of emissions; and
  - Locations of emission points.

- List of Records. A list of records (NSPS or permit requirements) to be inspected will allow officials to gather and make them available to the inspector.

- Accompaniment. It is imperative that a facility official accompany the inspector during the inspection, not only to describe the plant and its principal operating characteristics, but also to identify confidential data and for safety and liability considerations.

- Safety Requirements. The inspector should determine what facility safety regulations including safety equipment requirements will be involved in the inspection, and should be prepared to meet these requirements. The inspector should also inquire about emergency warning signals and procedures.

- Meeting Schedules. A schedule of meetings with key personnel (if necessary) will allow them to allocate a clear time to spend with the inspector.

- Closing Conference. A post-inspection meeting should be scheduled with the appropriate officials to provide a final opportunity to gather information, answer questions, and make confidentiality declarations.

- New Requirements. The inspector should discuss any new rules and regulations that might affect the facility and answer questions pertaining to them. If the inspector is aware of proposed rules that might affect the facility, he or she may wish to encourage facility officials to obtain a copy.

- Duplicate Samples and/or Simultaneous Measurements. Facility officials should be informed of their right to receive a duplicate of any physical sample collected for laboratory analysis or to conduct simultaneous measurements such as visible emission observations.

- Confidentiality Claims. Company officials should be advised of their right to request confidential treatment of trade secret information (see Section 3.8).

- Photographs. If necessary, the inspector should request permission to take photographs during the inspection. (See Section 3.9 for more discussion of the use of photographs.)

3.5 INSPECTION DOCUMENTATION

The air compliance inspection is generally conducted to achieve one or more of three main objectives.

1. To provide data and other information for making a compliance determination.

2. To provide evidentiary support for some type of enforcement action.

3. To gather the data required for other agency functions.

Taking physical samples, reviewing records, and documenting facility operations are the methods used by the inspector to develop the documentary support required to accomplish these objectives. The documentation from the inspection establishes the actual conditions existing at the time of the inspection so that the evidence of these conditions may be objectively examined at a later time in the course of an enforcement proceeding or other compliance related activity.

Documentation is a general term referring to all print and mechanical media produced, copied, or taken by an inspector to provide evidence of facility status. Types of documentation include the field notebook, field notes and checklists, visible emission observation forms, drawings, flowsheets, maps, lab analyses of samples, chain of custody records, statements, copies of records, printed matter, and photographs. Any documentation gathered or produced in the course of the inspection process may eventually become part of an enforcement proceeding. It is the inspector's responsibility to recognize this possibility and ensure that all documentation can pass later legal scrutiny.

3.5.1 Inspector's Field Notebook and Field Notes

The core of all documentation relating to an inspection is the inspector's field notebook or field notes, which provide accurate and inclusive documentation of all field activities. Even where certain data or other documentation is not actually included in the notebook or notes, reference should be made in the notebook or notes to the additional data or documentation such that it is completely identified and it is clear how it fits into the inspection scheme.

The field notebook and/or notes form the basis for both the inspection report and the evidence package and should contain only facts and pertinent observations. Language should be objective, factual, and free of personal feelings or terminology that might prove inappropriate.

Since the inspector may eventually be called upon to testify in an enforcement proceeding, or his/her field data may be entered into evidence, it is imperative that he/she keep detailed records of inspections, investigations, samples collected, and related inspection functions. The types of information that should be entered into the field notebook or notes include:

- Observations. All conditions, practices, and other observations relevant to the inspection objectives or that will contribute to valid evidence should be recorded.

- Procedures. Inspectors should list or reference all procedures followed during the inspection such as those for entry, sampling, records inspection, and document preparation. Such information could help avoid damage to case proceedings on procedural grounds.

- Unusual Conditions and Problems. Unusual conditions and problems should be recorded and described in detail.

- Documents and Photographs. All documents taken or prepared by the inspector should be noted and related to specific inspection activities. (For example, photographs taken at a sampling site should be listed, described, and related to the specific sample number.)

- General Information. Names and titles of facility personnel and the activities they perform should be listed along with other general information. Pertinent statements made by these people should be recorded. Information about a facility's recordkeeping procedures may be useful in later inspections.

The field notebook is apart of the Agency's files and is not to be considered the inspector's personal record although copies may be made for the inspector's "working file." Notebooks are usually held indefinitely pending disposition instructions.

3.5.2 The Visible Emission Observation Form

Since visible emission (VE) observations are such a frequently used enforcement tool, a separate form has been developed for recording data from the VE observation (see Figure 3-1). This form has been designed to include all the supporting documentation necessary, in most cases, for VE observation data to be accepted as evidence of a violation. Thus, it is recommended that the inspector utilize this form for recording opacity observations; an appropriate reference should be made to the form in the field notebook or notes.

3.5.3 Samples, Chain of Custody, and Laboratory Analysis

Samples are often gathered by inspectors. For the laboratory analysis of a sample to be admissable as evidence, a logical and documented connection must be shown between the samples taken and the analytical results reported. This connection is shown by using the chain of custody procedures which serve to document sample integrity from the time the sample was taken to the time it is analyzed. Chain of custody procedures are described in detail in Section 3.9.

3.5.4 Drawings and Maps

Schematic drawings, flowsheets, maps, charts, and other graphic records can be useful as supporting documentation. They can provide graphic clarification of site location relative to the overall facility, relative

SOURCE NAME

ADDRESS

CITY | STATE | ZIP

PHONE | SOURCE ID NUMBER

PROCESS EQUIPMENT | OPERATING MODE

CONTROL EQUIPMENT | OPERATING MODE

DESCRIBE EMISSION POINT
START STOP

HEIGHT ABOVE GROUND LEVEL
START STOP

HEIGHT RELATIVE TO OBSERVER
START STOP

DISTANCE FROM OBSERVER
START STOP

DIRECTION FROM OBSERVER
START STOP

DESCRIBE EMISSIONS
START STOP

EMISSION COLOR
START STOP

PLUME TYPE CONTINUOUS ☐
FUGITIVE ☐ INTERMITTENT ☐

WATER DROPLETS PRESENT
NO ☐ YES ☐

IF WATER DROPLET PLUME
ATTACHED ☐ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START STOP

DESCRIBE BACKGROUND
START STOP

BACKGROUND COLOR
START STOP

SKY CONDITIONS
START STOP

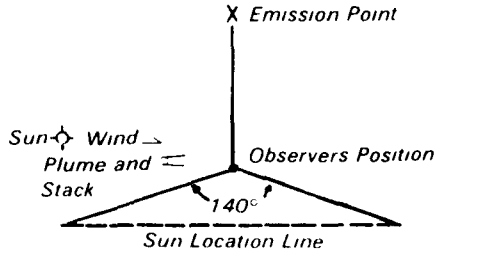
WIND SPEED
START STOP

WIND DIRECTION
START STOP

AMBIENT TEMP
START STOP

WET BULB TEMP | RH,percent

Source Layout Sketch — Draw North Arrow



OBSERVATION DATE | START TIME | STOP TIME

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
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21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

AVERAGE OPACITY FOR HIGHEST PERIOD | NUMBER OF READINGS ABOVE % WERE

RANGE OF OPACITY READINGS MINIMUM MAXIMUM

OBSERVER'S NAME (PRINT)

COMMENTS | OBSERVER'S SIGNATURE | DATE

ORGANIZATION

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE | CERTIFIED BY | DATE

TITLE | DATE | VERIFIED BY | DATE

Figure 3-1. Visible Emission Observation Form

height and size of objects, and other information which, in combination with samples, photographs, and other documentation, can produce an accurate, complete, evidence package.

Drawings and maps should be simple and free of extraneous details. Basic measurements and compass points should be included, if necessary, to provide a scale for interpretation.

3.5.5 Copies of Records

A facility's records and files may be stored in a variety of information retrieval systems, including written or printed materials, computer or electronic systems, or visual systems such as microfilm and microfiche.

When copies of records are necessary for an inspection report, storage and retrieval methods must be taken into consideration:

- Written or printed records can generally be photocopied on-site. Portable photocopy machines may be available to inspectors through the Regional Office. When necessary inspectors are authorized to pay a facility a "reasonable" price for the use of facility copying equipment. All copies made for or by the inspector should be initialed and dated for identification purposes (see identification procedures below). (When photocopying is impossible or impractical, close-up photographs may be taken to provide suitable copies.)

- Computer or electronic records may require the generation of "hard" copies for inspection purposes. Arrangements should be made during the opening conference, if possible, for these copies. (Photographs of computer screens may possibly provide adequate copies of records if other means are impossible.)

- Visual systems (microfilm, microfiche) usually have photocopying capacity built into the viewing machine, which can be used to generate copies. (Photographs of the viewing screen may provide adequate copies if "hard" copies cannot be generated.)

Immediate and adequate identification of records reviewed is essential to ensure the ability to identify records throughout the Agency custody process and to ensure their admissibility in court. When inspectors are called to testify in court, they must be able to positively identify each particular document and state its source and the reason for its collection. Initial, date, number, and record the facility's name on each record, and reference these items in the field notebook or notes.

- Initialing/Dating. The inspector should develop a unique system for initialing and dating records and copies of records so that he/she can easily verify their validity. This can be done by initialing each document in a similiar position, or by another method, at the time of collection. Both the original and copy should be initialed. All record identification notations should be made on the back of the document.

- Numbering. Each document or set of documents substantiating a suspected violation or violations should be assigned an identifying number unique to that document. The number should be recorded on each document and in the field notebook.

- Logging. Documents obtained during the inspection should be entered in the field notebook or notes according to some logical system. The system should include the following information:

  - Identifying Number.
  - Date.
  - The reason for copying the material.
  - The source of the record.
  - The manner of collection.

Other considerations regarding the handling of copies of facility records are listed below.

- Originals must be returned to the proper personnel or to their correct location.

- Related records should be grouped together.

- Confidential business records should be handled according to the procedures discussed in Section 3.8.

3.5.6 Statements

On a rare occasion it may be considered necessary to the objectives of the inspection to obtain a formal statement from a person(s) who have personal, firsthand knowledge of relevant facts. A statement of fact is signed by the person who can testify to those facts in court. The principal objective of obtaining a statement is to record in writing, clearly and concisely, relevant factual information so that it can be used as documentary support. In most cases, however, a 114 letter is used at a later date to obtain pertinent information. The following are procedures and considerations for use if it is ever necessary for the inspector to take a statement.

- Determine the need for a statement. Will it provide useful information? Is the person making the statement qualified to do so by personal knowledge?

- Ascertain all the facts and record those which are relevant and which the person can verify in court. Make sure all information is factual and firsthand. Avoid taking statements that cannot be personally verified.

- In preparing a statement use a simple narrative style; avoid stilted language.

  - Narrate the facts in the words of the person making the statement.

- Use the first-person singular.
- Present the facts in chronological order (unless the situation calls for other arrangement).

- Positively identify the person (name, address, position).

- Show why the person is qualified to make the statement.

- Have the person read the statement and make any necessary corrections before signing. All mistakes that are corrected must be initialed by the person making the statement.

- Ask the person making the statement to write a brief concluding paragraph indicating that he or she read and understood the statement. (This safeguard will counter a later claim that the person did not know what he or she was signing.)

- Have the person making the statement sign it.

- If he or she refuses to sign the statement, elicit an acknowledgement that it is true and correct. Ask for a statement in his or her own hand ("I have read this statement and it is true but I am not signing it because..."). Failing that, declare at the bottom of the statement that the facts were recorded as revealed and that the person read the statement and avowed it to be true. Attempt to have any witness to the statement sign the statement including witness' name and address.

- Provide a copy of the statement to the signer if requested.

3.5.7 Printed Matter

Brochures, literature, labels, and other printed matter may provide important information regarding a facility's condition and operations. These materials may be collected as documentation if, in the inspector's judgment, they are relevant. All printed matter should be identified with the date, inspector's initials, and related sample numbers. Reference to these materials should be made in the field notebook or notes.

3.5.8 Photographs

The documentary value of photographs ranks high as admissible evidence; clear photos of relevant subjects, taken in proper light and at proper lens settings, provide an objective record of conditions at the time of inspection. However, the use of photographic documentation often elicits a negative reaction from plant officials, thus, it is recommended that photographic documentation be used only sparingly and only when necessary to document an inspection finding.

When a situation arises that dictates the use of photographs, the inspector should obtain the company's permission to take photographs. This is

most conveniently accomplished during the opening conference. The inspector may offer to provide the official with duplicates of all photographs taken. As with other business data collected, during and/or at the conclusion of the inspection, the inspector should ascertain whether any of the photographs taken contain proprietary information and if the company wishes to designate any as confidential. Photographs taken employing a Polaroid-type instant camera are useful for inspections because they allow an immediate confidentiality review and the opportunity for the inspector to readily provide the company with duplicate shots.

The inspector must be tactful in handling any concerns or objections about the use of a camera. In some cases, the inspector may explain that emission related information is public information and not considered confidential. The photographs will generally be limited to air pollution control equipment and the inspector can offer to shield any proprietary features in the background.

In the event the permittee's representative still refuses to allow photographs and the inspector believes the photographs will have a substantial impact on future enforcement proceedings, Regional enforcement attorneys should be consulted for further instructions. At all times the inspector is to avoid confrontations that might jeopardize the completion of the inspection.

Photographs may always be taken from areas of public access (e.g. outside the fence, from the road, from a parking lot, etc.) as long as no unusual equipment is used.

3.5.8.1 Equipment - A single lens reflex camera should be used whenever one is available. This type of camera will take high-quality photographs, enable the inspector to use a variety of film speeds, and allow the use of appropriate lenses.

It is suggested that all photographs should be made with color print film since additional equipment, such as projector and screen, are not needed to review the photographs. Also, the negatives are easily duplicated and the prints can be enlarged and distributed as needed.

3.5.8.2 Scale, Location, and Direction - It is useful to photograph a subject from a point that will indicate the location and direction of the subject. The addition of an object of known size (e.g., a person) will help indicate the approximate size of the subject.

3.5.8.3 Safety - In areas where there is a danger of explosion, flash photographs should not be taken. If there is a danger of electrical shock, photographs should be taken from a distance known to be safe.

3.5.8.4 Documenting Photographs - A photographic log should be maintained in the inspector's field notes for all photographs taken during an inspection, and the entries are to be made at the time the photograph is taken. These entries are to be numerically identified so that after the film is developed

the prints can be serially numbered corresponding to the logbook descriptions and, if necessary, pertinent information can be easily transferred to the back of the photograph. The log entries are to include:

- Signature of the photographer;
- Description of film used (i.e., its expiration date, ASA number, origin, etc.);
- Focal length of the lens being used;
- F-stop and shutter speed at which the camera is set;
- Lighting conditions encountered;
- Time of day, weather conditions;
- Date;
- Location; and
- A brief descripton of the subject being photographed.

Polaroid-type instant photos should be immediately identified on the back after shooting with the corresponding photo ID number; photographs which require developing and printing should be numbered as soon as possible. One recommendation which will ensure that all prints and negatives can be positively identified is that prints and negatives be left uncut and the photographic log be photographed at the beginning and end of each roll of film. Photographs of a confidential nature must be developed by an authorized contractor.

3.6 CLOSING CONFERENCE

The closing conference with facility officials enables the inspector to "wrap up" the inspection including answering any questions the company may have, filling in any gaps in the data collected, and identifying information considered confidential. Thus, the following elements generally constitute the closing conference.

- Review of Inspection Data. At this point, the inspector can identify and fill in any gaps in the information collected and ensure that there is general agreement on the technical facts.

- Inspection Follow-up Discussion. The inspector should be willing to answer inspection related questions from facility officials, but should only state matters of fact. Under no circumstances should the inspector make judgments or conclusions concerning the facility's compliance status, legal effects, or enforcement consequences.

- Declaration of Confidential Business Information. Plant officials authorized to make business confidentiality claims should be given the opportunity to asset a claim of confidentiality by noting such claim on documentary material provided to EPA (or its contractor).* The inspector should note all information claimed confidential and handle materials accordingly, even if a written declaration is not made at this time (see Section 3.8).

*It is the policy of most Regional offices not to give the source copies of the inspector's notes and/or checklists. In lieu, some Regions offer to forward the source a copy of the inspection report upon request.

- Preparation of Receipts. The inspector should prepare and deliver receipts for any samples or records taken.

Since EPA and State inspectors are often the only direct contact between the regulatory agency and the regulated industry, the inspector should always be aware of opportunities to improve industry-agency relations. The closing conference provides an ideal opportunity to offer various kinds of assistance to facility officials. At this point, the inspector has first-hand knowledge of questions, problems, and possible solutions to problems. The inspector should consider:

- Answering all questions within his ability and authority.
- Referral of questions and problems to other EPA personnel when necessary.
- Discussion of problems and tactful suggestion of possible solutions and assistance.
- Tactful probing of problem areas uncovered during the inspection.
- Offering or suggesting available resources such as technical publications, special services available to industry, etc.

It is very important that the inspector follow up all referrals and offers of help. A letter, phone call, or repeat visit will indicate to facility officials a genuine interest on the part of the agency and aid the Agency's industry relations.

3.7 FILE UPDATE AND REPORT PREPARATION

During the inspection, the inspector collects and substantiates inspection data which may later be used as evidence in an enforcement proceeding. When he/she returns to the office it is his/her responsibility to see that this data is organized and arranged so that other agency personnel may make maximum use of it. Thus, the file update and inspection report preparation are an important part of the inspection process. These should both be done as soon as possible after the inspection to ensure that all events of the inspection are still fresh in the inspector's memory. He/she must be able to confirm during a later enforcement proceeding that the information contained in the inspection report is true.

3.7.1 File Update

The U. S. EPA including the Regional Offices utilize several types of "files" for facility information storage, which include the computer data bases CDS (Compliance Data System) and NEDS (National Emissions Data System) and hard copy storage, the agency source files. For the efforts of the inspection to be most beneficial, the information collected must be used to update each of these files (or state equivalent such as EIS/P&R).

3.7.1.1 CDS - The Compliance Data System is an EPA managed computer data system containing information relevant to the compliance status of regulated facilities. The information stored includes the following categories of data for each facility.

- General Facility Information
  - Name
  - Address
  - Industrial Process Type

- Compliance Related Activities
  - Inspections
  - Opacity Observations
  - Source Tests
  - Issuance of NOV's
  - Notices of Start-Up, Construction
  - Pending Actions

- Point Source Information
  - Process Equipment
  - Pollutants
  - Applicable Regulations
  - Control Equipment
  - Production Rates

- Monitoring Data (CDS/CEM Subset)
  - CEM Instrument Data
  - Applicable Regulations
  - CEM Related Activities
  - Excess Emission Report Summaries

The inspector should check to see if any of this data is missing or has changed since the last update and then work within the office system to use the data he has collected to update CDS. Since CDS data form the basis for virtually all Agency reporting on compliance status, a current data base is absolutely essential to Agency programs for use in making air management planning and budgetary decisions.

3.7.1.2 NEDS - The National Emissions Data System is an EPA managed computer data system containing information related to emissions from each point source at a facility. This information is used in air quality modeling, air management planning, and related activities. The information stored includes the following categories of data for each facility.

- General Facility Information
  - Name
  - Address
  - Industrial Process Type
  - Air Quality Control Region Coordinates

- Point Source Information
  - Process Equipment
  - Production Capacity
  - Production Rate
  - Production Schedule
  - Pollutants
  - Control Equipment
  - Control Efficiencies
  - Stack Data
  - Emission Factors
  - Emission Estimates

As was recommended for CDS, the inspector should check to see if any of this data is missing or is not up-to-date and ensure that the missing or current data available from the inspection is used to update NEDS.

3.7.1.3 Agency Files - The Agency files, particularly those at the Regional offices usually contain the hard copies of all information, correspondence, reports, etc. relevant to a particular facility. Examples of such items are listed below.

- General Facility Information
- Correspondence to Facility
- Correspondence from Facility
- Permit Applications
- Permits
- Facility Layout
- Flowcharts
- Raw Data from Inspections
- Inspection Reports
- Source Test Reports
- Excess Emission Reports
- Case Development Workups
- Agency Notes, etc. on Compliance Actions

The inspector's data should be used to update the general facility information including plant contact, correct address, changes in production rates, new flowcharts, layouts, etc. and of course, the inspector's raw data and inspection report will be added to the file.

3.7.1.4 Inspector's "Working" File - In the course of updating the agency's computerized data bases and facility file, the inspector should take the opportunity to update his own "working" file on the facility (see Description Section 3.1.1). This should not require much effort since the "working" file is a summary file for the inspector's use; however, the effort made will usually pay off in the long run with quick-to-retrieve information on a particular facility.

3.7.2 Report Preparation

The inspector's inspection report serves two very important purposes in agency operations: (1) it provides other agency personnel with easy access to the inspection information because it has been organized into a comprehensive, usable document; and (2) it constitutes a major part of the evidence package on the inspection which will be available for subsequent enforcement proceedings and/or other types of compliance-related follow-up activities.

To meet the objectives discussed above, the information contained in the inspection report must be:

- Accurate. All information must be factual and based on sound inspection practices. Observations should be the verifiable result of firsthand knowledge. Compliance personnel must be able to depend on the accuracy of all information.

- Relevant. Information in an inspection report should be pertinent to the objectives of inspection. Irrelevant facts and data will clutter a report and may reduce its clarity and usefulness.

- Comprehensive. Suspected violation(s) should be substantiated by as much factual, relevant information as is feasible to gather. The more comprehensive the evidence is, the better and easier the outcome of any enforcement action will be.

- Coordinated. All information pertinent to the subject should be organized into a complete package. Documentary support (e.g., photographs, statements, sample documentation, etc.) accompanying the report should be clearly referenced so that anyone reading the report will get a complete, clear overview of the situation.

- Objective. Information should be objective and factual; the report should not speculate on the ultimate result of any factual findings.

- Clear. The information in the report should be presented in a clear, well-organized manner.

- Neat and Legible. Allow time to prepare a neat, legible report.

3.7.2.1 Elements of the Inspection Report - Although specific information contained in the inspection report will vary depending upon the inspection objectives, most reports will contain the same basic elements:

- Cover page

- Narrative report; and

- Documentary support.

3.7.2.1.1 Cover Page - A cover page is used for easy access to basic facility information. It should include:

- Facility name and address,
- Facility identification number,
- Facility contact and/or representative (including phone number),
- Type of inspection,
- Date of inspection, and
- Inspector's name.

3.7.2.1.2 Narrative Report - The narrative portion of an inspection report should be a concise, factual summary of observations and activities, organized in a logical, legible manner, and supported by specific references to accompanying documentary support.

The following work plan will simplify preparation of the inspection report and will help ensure that information is organized and in a usable form. The basic steps in writing the narrative report include:

- Reviewing the Information. The first step in preparing the narrative is to collect all information gathered during the inspection. The inspector's field notebook should be reviewed in detail. All evidence should be reviewed for relevance and completeness. Gaps may need to be filled by a phone call or, in unusual circumstances, by a follow-up visit to the facility.

- Organizing the Material. The information may be organized in many forms depending on the individual need, but should present the material in a logical, comprehensive manner. The narrative should be organized so that it will be easily understood by the reader.

- Referencing Accompanying Material. All documentary support accompanying a narrative report should be clearly referenced so that the reader will be able to locate these documents easily. All documentary support should be checked for clarity prior to writing the report.

- Writing the Narrative Report. Once the material collected by the inspector has been reviewed, organized, and referenced, the narrative can be written. The purpose of the narrative is to record factually the procedures used in, and findings resulting from, the evidence-gathering process. The inspector need only refer to routine procedures and practices used during the inspection, but should describe facts relating to potential violations and discrepancies in detail.

If the inspector follows the steps presented, the report should develop logically from the organizational framework of the inspection. In writing the narrative, the inspector should keep the following in mind:

- Use a simple writing style; avoid stilted language.
- Use an active, rather than passive approach: (e.g., "He said that..." rather than "It was said that...").
- Keep paragraphs brief and to the point.
- Avoid repetition.
- Proofread the narrative carefully.

A basic format which can be adapted for most narrative reports is outlined below.

- General Inspection Information
  - Inspection objectives
  - Facility selection scheme
  - Inspection facts (date, time, location, plant official, etc.)

- Summary of Findings
  - Factual compliance findings (include problem areas)
  - Compliance status with applicable regulations
  - Administrative problems (as with entry, withdrawal of consent, etc.)
  - Recommended future action (if appropriate)

- Facility Information
  - Process information
  - Raw materials, production rates
  - Control equipment
  - Applicable regulations
  - Enforcement history

- Inspection Procedures and Detail of Findings
  - Refer to standard procedures used
  - Describe nonroutine procedures used
  - Reference inspection data attached
  - Note and reference any statements taken
  - Reference photographs, if relevant
  - Reference any drawings, charts, etc. made
  - Reference visible emission observation forms
  - List records reviewed and address inadequacies

- Sampling
  - Refer to methods used
  - Reference analytical results attached

- Attachments
  - List of all documentary support attached

3.7.2.1.3 Documentary Support - The documentary support is all evidence referred to in the inspection report. It will include:

- Inspector's field notes, forms, checklists;
- Drawings, charts, etc;
- Photographs;
- Analysis results of sample collected;
- Statements taken; and
- Visible emission observation forms.

3.7.2.2 Confidential Business Information - In preparing the report, material claimed confidential business information should preferably be referenced in a nonconfidential manner. Alternatively, the report may include the confidential information; however, the entire inspection report must then be treated as a confidential document (see Section 3.8).

3.8 HANDLING CONFIDENTIAL BUSINESS INFORMATION

As part of the data gathering involved in the air compliance inspection, the inspector may encounter and/or collect information claimed confidential by the company. It is recommended that such information be avoided unless it is essential to the inspection objectives. The less confidential data collected, the less confidential data that will require safeguarding. At all times during the inspection, the inspector should communicate to the company officials that the Agency has an organized, secure scheme for confidential business information handling. This will do much to increase their confidence and rapport with the Agency.

The remainder of this section describes procedures which must be followed for the handling of confidential business in those cases where it proves necessary to collect it.

3.8.1 Federal Laws and Regulations Governing Confidential Business Information

Trade secrets and confidential information are protected from public disclosure by Section 114 (c) of the Clean Air Act. The type of information that may be claimed confidential business information is defined in Title 40, Code of Federal Regulations, Part 2, as amended.[6] Part 2 (211) also covers the penalty for wrongful disclosure:

> "(A) No EPA Officer or employee may disclose, or use for his or her private gain or advantage, any business information which came into his or her possession, or to which he or she gained access, by virtue of his or her official position or employment, except as authorized by this subpart.
>
> (B) Each EPA Officer or employee who has custody or possession of business information shall take appropriate measures to properly safeguard such information and to protect against its improper disclosure.
>
> (C) Violation of paragraphs (A) or (B) of this section shall constitute grounds for dismissal, suspension, fine, or other adverse personnel action. Willful violation of paragraph (A) of this section may result in criminal prosecution under 18 U.S.C. 1905 or other applicable statute."

3.8.2 Defining Confidential Business Information

From the inspector's standpoint, confidential information may be defined as information received under a claim of confidentiality (see Section 3.8.3) which may concern or relate to trade secrets, processes, operations, style of work, apparatus, confidential statistical data, amount or source of any income, profits, losses, or expenditures. This information could be in written form, in photographs, or in the inspector's memory.

3.8.3 Declaration of Confidential Business Information

Section 114 (a) of the Clean Air Act states that an inspector may sample any emissions, request information, have access to and copy any records, and inspect any equipment.[4] The information that is collected is available to the public. If a company does not want inspection information to be available to the public, it must request that the Administrator of EPA consider the information confidential. In its declaration of confidential business information, the company must show that the information, if made available, would divulge trade secrets. The information may then be handled as if it were confidential, but may still be disclosed to authorized representatives of EPA.

Therefore, a business is entitled to make a declaration or claim of confidentiality for all information that an inspector requests or has access to; but a business may not refuse to release information requested by the inspector under the authority of Section 114 of the Act on the grounds that the information is considered confidential or a trade secret. The claim of confidentiality relates only to the public availability of such data and cannot be used to deny access to a facility to EPA inspectors performing duties under Section 114 of the Act.

Information which EPA determines to be emissions data or not trade secret may, upon such a determination and upon notice to the company, be disclosed to the public. See Reference 2 for a description of relevant procedures.

It is the inspector's responsibility to inform company officials during the opening conference of their rights regarding confidentiality claims. He should explain that they will have the opportunity both during and after the inspection to identify any data to be claimed confidential. They may then supply the inspector with a written Declaration of Confidential Business Information listing each item at the closing conference, or at a later date. The inspector should handle data identified as confidential in a confidential manner until the company has made its written claim. Claims should include:

- Name, title, and address of firm and individual making the declaration;
- Date of declaration;

- List, by title or description of all information or samples claimed confidential;
- Dates and other information concerning data that requires confidential treatment only until a certain date or event;
- EPA Regional Office; and
- Name and title of inspector.

The paragraph below is an excerpt from 40 CFR Part 2[6] and is suggested language for use by the inspector in explaining claims of confidentiality.

> "If you believe that any of the information required to be submitted pursuant to this request is entitled to be treated as confidential, you may assert a claim of business confidentiality, coveraing all or any part of the information, by placing on (or attaching to) the information a cover sheet, stamped or typed legend, or other suitable notice, employing language such as "trade secret," "proprietary," or "company confidential." Allegedly confidential portions of otherwise nonconfidential information should be clearly identified. If you desire confidential treatment only until a certain date or until the occurrence of a certain event, the notice should so state. Information so covered by a claim will be disclosed by EPA only to the extent, and through the procedures, set forth at 40 CFR Part 2, Subpart B."

3.8.4 Receipt of Confidential Business Information

As stated previously, the inspector must be careful to identify all privileged information collected during an inspection. And, since confidential information involves extra handling, paperwork and possible legal consequences, he should avoid collecting privileged information unnecessarily. Under ideal circumstances, a facility official will accompany the inspector and make preliminary indications of information which may be claimed confidential. The inspector himself should never speculate whether any data claimed confidential will eventually be determined confidential; this determination is a legal and administrative policy decision and not within the inspector's authority.

If possible, confidential information should not be entered into the field notebook. One technique is to use a nonconfidential reference to the information in the notebook and separate sheets (which are considered separate documents) on which to record the confidential information.

Photocopies or manual copies of records or other documents considered confidential can be separated and kept with the confidential field notes. At the end of the inspection, the inspector should make a complete inventory of the confidential information received. This may be done during the closing conference where the company officials may to make their claims of confidentiality. Company officials should be informed that they may also make claims of confidentiality at a later time.

Each page of confidential information received should be stamped with a statement such as these examples below.

CONFIDENTIAL BUSINESS INFORMATION

CLAIMED CONFIDENTIAL

DOCUMENT_____ PAGE_____OF_____
REC'D. FROM_____DATE_____
REC'D. BY_____PN_____

An inventory should be prepared which lists for each document:

- Document number;
- Number of pages;
- Brief description;
- Date received.

3.8.4.1 Samples - If the company has declared a physical sample confidential business information, the inspector should mark the seal "Confidential Business Information."

3.8.5 Handling in the Field

The inspector may sometimes be on the road for several days while doing inspections. During this time, it is his/her full responsibility to ensure that the confidential information collected is handled securely. Procedures for handling in the field are listed below.

- Documents and field notes are considered secure if they are in the physical possession of the inspector and are not visible to others while in use.

- Confidential inspection documents should be kept inside an unlabeled envelope which is in a locked briefcase. If it is impractical to carry the briefcase into a given siutation, the briefcase may be stored in a locked area such as a motel room or the trunk of a motor vehicle.

- If it is necessary for the inspector to review a confidential document, it should be done in privacy since the "Confidential Business Information" marking is likely to arouse curiosity. If privacy is violated, the documents must be shielded from view immediately.

- Physical samples should be placed in locked containers and stored in a locked portion of a motor vehicle. The chain of custody procedures provide further protection for ensuring the integrity of the sample.

3.8.6 Handling in the Office

Immediately upon return to the agency, the potentially confidential information (data, charts, drawings, etc.) should be placed in a secure, locked file cabinet (in a locked room) designated especially for confidential information. Only personnel authorized by the Regional Administrator, Division Director, or Branch Chief will be allowed access to the file. Records should be kept of every person who uses a document including their name, signature, and date taken from file. EPA Form 1481-2, Privileged Information Control Record, may be used for this purpose.[8]

Samples considered confidential should be assigned a document number and sent to an approved lab for analysis. The chain of custody and analysis results should bear this document number. At all times prior to analysis and/or disposal, the samples should be stored in a locked cabinet. Analysis results should also be treated as confidential information.

Copies of information marked "trade secret" and/or "confidential" should not be made unless written authorization has been obtained from the Regional Administrator, Division Director, or Branch Chief. When it becomes necessary to copy privileged information, all copies should be included in the confidential document inventory and accounted for as would be an original.

Requests for access to confidential information by any member of the public, or by an employee of a State, local, or Federal Agency, shall be handled according to the procedures contained in the Freedom of Information Act regulations (40 CFR Part 2).[6] All such requests shall be referred to the responsible Regional organizational unit.

3.8.7 Privileged Data and Report Preparation

In preparing the inspection report, it is recommended that confidential information be referenced in a nonconfidential manner (i.e., by reference to the document in the confidential files and a general description of the information contained therein). If necessary, the confidential data may be included in the report, but the entire report must then be treated as a confidential document.

3.9 CHAIN OF CUSTODY PROCEDURES

An important aspect of the introduction of evidence during enforcement proceedings is documentation of the possession and handling of that evidence from the moment of its collection to its introduction as evidence. This documentation is generally referred to as the "chain of custody." Chain of custody documentation assures the court or other quasi-judicial body of the data integrity and is applicable to the following types of evidence.

- Samples
- Photographs
- Field Notes
- Laboratory Notes

The most rigorous proof of a chain of custody is usually required for physical samples, thus this discussion will focus on chain of custody procedures for samples.

3.9.1 Elements of Custody

A sample or document is in "custody" if:

- It is in one's actual physical possession.
- It is in one's view.
- It was in one's physical possession and it was secured so it couldn't be tampered with.
- It is kept in a secured area with access restricted to authorized personnel only.
- It is placed in a container or other receptacle sealed with an Official Seal (see Figure 3-2) that will be broken when the receptacle is opened.

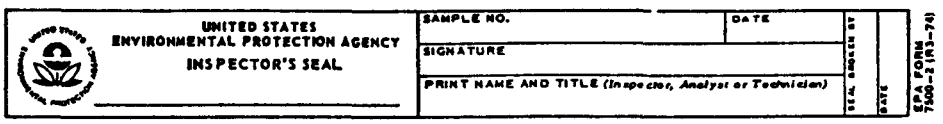


Figure 3-2. Official Seal for Chain of Custody.

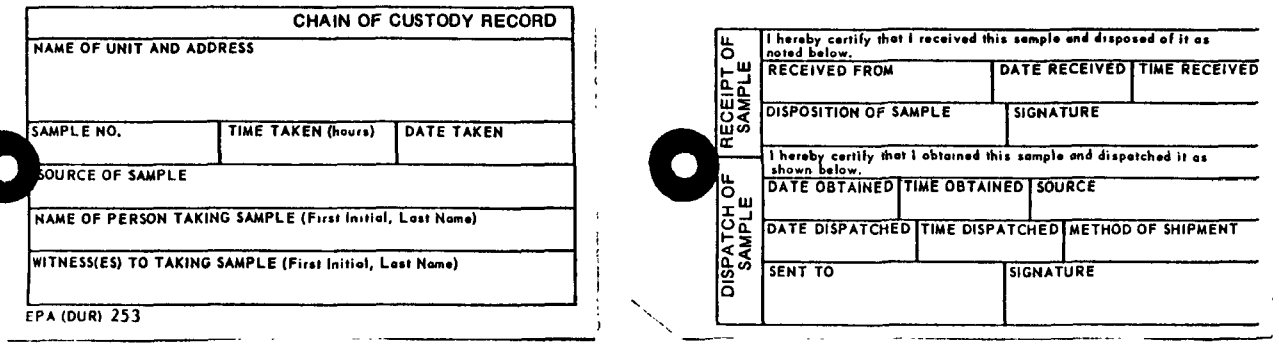
3.9.2 Chain of Custody Procedures

Establishing and maintaining the chain of custody requires adherence to a number of procedures which ensure the integrity of the sample. These procedures are initiated with the identification of the sample and continue through sample transit, laboratory analysis, until introduction of the data into evidence. Sample integrity is generally easier to document as the number of people who handle the sample decreases. Thus, all chain of custody procedures are aimed at limiting the number of persons who handle the sample or the data.

1. Establishing Custody. Sample custody is initiated at the time of collection by labeling the sample with a sample tag (see Figure 3-3) and sealing the sample with the Official Seal. The sample container or wrapper is sealed with the Official Seal so that it may not be opened at any point without breaking the seal and/or the original unit package. No more than one sample should be sealed under one seal.

If the company declares a physical sample confidential business information, the inspector should mark the tag and seal "Confidential Business Information." (See Section 3.8 for more discussion of confidential business information.)

If it becomes necessary to break a seal, it should be mounted on a piece of paper, properly initialed and dated and submitted with the sample records to provide as part of the continuous history of the sample. The sample itself should be resealed with a new seal.


CHAIN OF CUSTODY RECORD

NAME OF UNIT AND ADDRESS

SAMPLE NO.	TIME TAKEN (hours)	DATE TAKEN

SOURCE OF SAMPLE

NAME OF PERSON TAKING SAMPLE (First Initial, Last Name)

WITNESS(ES) TO TAKING SAMPLE (First Initial, Last Name)

EPA (DUR) 253

RECEIPT OF SAMPLE

I hereby certify that I received this sample and disposed of it as noted below.

RECEIVED FROM	DATE RECEIVED	TIME RECEIVED

DISPOSITION OF SAMPLE	SIGNATURE

DISPATCH OF SAMPLE

I hereby certify that I obtained this sample and dispatched it as shown below.

DATE OBTAINED	TIME OBTAINED	SOURCE

DATE DISPATCHED	TIME DISPATCHED	METHOD OF SHIPMENT

SENT TO	SIGNATURE

Figure 3-3. Example of a Sample Tag.

2. Preparing Sample Documentation. A major aspect of the chain of custody is the preparation and maintenance of written information describing the collection, shipment, and storage of the sample. Preparation of this documentation is the responsibility of the inspector and lab personnel. Properly maintained, this documentation serves as a clear and complete account indicating the sample has remained intact from collection to introduction as evidence.

The sample must be consistently identified throughout this documentation. Sample numbers are used for this purpose; one unique

sample number is used for each sample. It should appear on all documentation relating to a sample including; seals, sample tags, the Chain of Custody Record, inspector's field notes, drawings, photographs, etc.

3. Coordinating Sample and Documentation. The inspector must assure that the relationship between the physical sample and the related documentation is clear, complete, and accurate. The sample number, date, and inspector's initials should appear on all documents, and the forms should be completed accurately and completely. An example chain of custody form or record is shown in Figure 3-4.

4. Ensuring Custody during Transit. Shipment to sample of the laboratory will involve the following procedures:

   - Samples must always be accompanied by the Chain of Custody Record. Copies of documents should be retained by the originator.

   - Sample packages which are mailed must be sent registered or certified mail with return receipt requested.

   - If sent by other common carrier, such as U.P.S., a bill of lading should be used.

   - Samples should be shipped to the person designated laboratory custodian and labeled "deliver to addressee ONLY." This person accepts custody and continues the chain of custody from that point onward.

   - All receipts and shipping documents must be included in the chain of custody documentation.

   - Shipped samples should always be properly packed to prevent breakage, and the package should be sealed or locked so that any evidence of tampering may be readily detected.

EPA United States Environmental Protection Agency

Chain of Custody Record

Inspector Name and Address	Sample Number	Task Number
	Inspection Number	
	Sample Name	
	Date Sample / Time / Duplicate Requested ( ) Yes ( ) No	
Inspector Signature	Location of Sampling	

Analysis/Testing Required

Laboratory			
Date Received			
Received By			
Sent Via			
Sample Condition			
Condition of Seals			
Units Received			
Storage Location			
Assigned By			
Assigned To			
Delivered By			
Date Delivered			
Number of Units Received			
Units Analyzed			
Date Seal Broken			
Date Resealed			
Resealed By			
Storage Location			
Date Results of Analysis Issued to EPA		Date Results of Analysis Issued to Facility	

Remarks

Figure 3-4. Example Chain of Custody Record.

3.10 REFERENCES

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7. DeWees, William G., von Lehmden, Darryl J. and Carl Nelson. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods. Section 3.12 - "Method 9 - Visible Determination of the Opacity of Emissions from Stationary Sources." U.S. Environmental Protection Agency. EPA 600/4-77-027b. August 1977.

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12. Air Pollution Compliance Monitoring Procedures. National Enforcement Investigations Center, Denver, Colorado. Office of Enforcement. U. S. Environmental Protection Agency.

13. Richards, John R. Counterflow Inspection Procedures. Draft Report by Engineering-Science, Durham, North Carolina under EPA Contract No. 68-01-6312, Task No. 28. April 1982.

4.0 RECORDKEEPING AND REPORTING

The U. S. Environmental Protection Agency (EPA) has promulgated regulations in 40 CFR Parts 51, 60 and 61, which require stationary sources to keep records and/or report data associated with national emission standards for new stationary sources and hazardous pollutants. These regulations include continuous emission monitoring, compliance testing, control device monitoring, process monitoring, ambient monitoring, and a variety of notification and information reports.

This chapter provides an overview of recordkeeping and reporting requirements under the aforementioned regulations. Source permits may include these or additional recordkeeping or reportig requirements of which the inspector should be aware. Information, including excess emission reports and performance test reports, which is reported to the agency (federal or state) under these regulations is often available to the inspector for review preceeding or following his on-site inspection. Records required to be kept by the source (and not reported) are available to inspector during the on-site inspection itself and can be checked and/or reviewed at that time.

The chapter is organized by source activities. Section 4.1 delineates the general reporting requirements for all sources affected by Parts 60 and 61. Section 4.2 addresses the continuous emission monitoring (CEM) requirements with emphasis on excess emission reports (EERs) and on CEM Performance Specification Tests (PSTs). Section 4.3 discusses the essentials of compliance source testing and reporting. Section 4.4 presents proposed forms for control device monitoring such as fabric filters, wet scrubbers, incinerators, and electrostatic precipitators. Process parameter monitoring is discussed in Section 4.5. Special NESHAP requirements that do not logically belong in the preceding sections are in Section 4.6.

Discussed separately within each section are the sources affected by the New Source Performance Standards (NSPS) and the National Emission Standards for Hazardous Air Pollutants (NESHAP); these regulatory requirements are summarized in narratives, tables, and figures. Recommended reporting formats are provided where appropriate. Inclusion of any data that exceed the minimum regulatory requirements is explained.

Since the majority of this chapter concerns NSPS and NESHAP requirements and these standards are constantly being revised and/or new standards are being promulgated, the reader is cautioned to consult the Federal Register, etc. for the most up-to-date information.

4.1 GENERAL REQUIREMENTS

In Subpart A, General Provisions, of CFR Parts 60 and 61 are the recordkeeping and recording requirements that, unless otherwise specified,

apply to all sources. The requirements for notification of dates for various source activities are discussed in this section. Other reports and records required by this subpart are discussed in Sections 4.2 and 4.3.

4.1.1 Regulatory Requirements

The requirements for NSPS sources in §60.7 are the notification of dates of source construction and anticipated startup, actual startup, and demonstration of CEM performance. The notification of the date of any performance tests is required by §60.8 Notification of dates should be by registered letter to the appropriate regulatory agency.

For NESHAP sources the notification of anticaipated and actual source startup dates and the submittal of an application to construct or modify a source is required by §61.07. Notification of dates should be by registered letter.

Tables 4-1 and 4-2 summarize the regulatory requirements for NSPS and NESHAP sources.

4.2 CONTINUOUS EMISSION MONITORING

EPA has promulgated regulations requiring certain NSPS facilities to install, maintain, and operate continuous emission monitoring (CEM) systems. In addition, EPA has required that State Implementation Plans (SIPs) be revised to require certain existing facilities to install, maintain, and operate CEM systems. These regulations require "performance testing" and "periodic reports and recordkeeping of the nature and magnitude of such emissions." Furthermore, new interpretation of Sections 113 and 114 of the Clean Air Act (CAA), as amended in 1977, requires the use of recordkeeping and reporting requirements as means of enforcing emission standards.

Historically, the reporting requirements for NSPS sources (40 CFR Part 60) have involved a written report for any calendar quarter in which source emissions exceed the value of the standard. The emission value, as recorded by the CEM system (i.e., % opacity, ppm, lb/ton, etc.) must be recorded, as well as the duration (i.e., six minutes, 3 hours, etc.) of the excess emission. An excess emission is defined as exceedance of the emission limit values over the time period specified by the subject standard. Similarly, 40 CFR Part 51 requires some existing stationary sources to implement a continous monitoring program and to provide quarterly excess emission reports (EERs). The minimum information required in the excess emission report is:

1. The magnitude, duration and date of excess emissions;

2. The identification of each excess attributable to startups, shutdowns, and malfunctions;

3. The cause of any malfunction and the corrective action or preventive measures adopted;

4. The date, time, and duration of any monitor outage for reasons other than zero and span checks;

TABLE 4-1. GENERAL REQUIREMENTS FOR NSPS SOURCES

Paragraph	Facility	Component affected in facility	Part 60, Subpart A Requirements	Notification/Reporting/Recordkeeping
60.7	New/modified		Date of construction or reconstruction	Not later than 30 days after date
			Date of initial startup	30-60 days prior to startup
			Actual date of startup	15 days after startup
			Physical/oper. changes	60 days before change, report nature of change, present/proposed control systems, production capacity before/after change, expected completion date of change
			Date demonstration of CEM performance commences	Not later than 30 days prior to date
		Entire facility	Startup, shutdown, malfunction	Records of occurrence/duration
		Air pollution control device	Device malfunction	Records of occurrence/duration
		Continuous Emissions Monitoring	If device or system inoperative	Records of occurrence/duration
		Entire facility	Excess emissions (EE)	Quarterly report postmarked 30th day following end of quarter to include: o Magnitude of EE o Conversion factors o Start date/time EE o End date/time EE o Date/time when CEM inoperative except zero/span o Nature of system repairs/adjustment o Identification of no EE o EE during start up/shut down/malfunction o Nature/cause of malfunction o Corrective action taken o Previous measures adopted

TABLE 4-1. GENERAL REQUIREMENTS FOR NSPS SOURCES (continued)

Paragraph	Facility	Component affected in facility	Part 60, Subpart A Requirements	Notification/Reporting/Recordkeeping
60.7 (cont'd.)		Entire facility	Recordkeeping	Maintain for 2 years all measurements of CEM, monitoring devices, PST, calibration checks, adjustments, and maintenance
60.8	New/modified	Entire facility	Peformance test	Within 60 days after maximum production rate, but not later than 180 days after startup Notification of performance specification test 30 days prior to test
60.13	New/modified	CEM	CEM performance evaluation	Two copies submitted within 30 days of evaluation

TABLE 4-2. *GENERAL REQUIREMENTS FOR NESHAP SOURCES*

Paragraph	Facility	Component affected in facility	Part 61, Subpart A Requirements	Notification/Reporting/Recordkeeping
61.07	New/modified	Entire facility	Construction/modification	Prior to date of construction/modification applications submitted for approval containing name/address of applicant, location of source, technical information on nature, size, design, capacity, operation, and control equipment of source
	New/modified	Entire facility	Anticipated startup	Notification between 30 and 60 days prior to startup
			Actual startup	Notification within 15 days after startup
61.12	All	Entire facility	Source tests	Source test reports as required

5. The reason for monitor outage and corrective action taken;

6. If there are no excess emissions and no monitor outages, this information must also be reported.

These reporting requirements were intended to provide the source operator the information and incentive to monitor and "fine tune" the pollution control device. However, as the EPA and many State air pollution control agencies expand their source emission monitoring programs, the EER is being used for enforcement of emission standards.

The EER is used by regulatory agencies for enforcement actions; therefore, the report must be thorough and complete. However, a recent survey of 22 NSPS NSPS sources required to submit EERs to EPA Regions V, VI, VII, and VIII, revealed that only 25 percent of the required information was reported to the Federal or State authorities. All 22 sources surveyed had omitted one or more of the following areas of information from the EER:

1) reason for the excess emissions.

2) action taken to reduce excess emissions.

3) malfunctions of the CEM system.

Another survey of 12 sources showed that CEM programs with good recordkeeping and notification procedures also have reliable CEM operations. EPA has not formalized an EER format and the CFR provides very little guidance to source operators attempting to comply with the regulations.

4.2.1 Regulatory Requirements

CEM systems are being used as compliance tools by both EPA and state agencies. Monitoring, recordkeeping, and data reporting requirements vary from state to state. State requirements for reporting excess emissions cannot be more lenient than the Federal regulation; however, they may be stricter. Variability in reporting excess emissions to regulatory agencies has caused concern when trying to correlate emissions with pollution control malfunctions across the nation.

The NSPS EER regulatory requirements are in 40 CFR Part 51 and 40 CFR Part 60 and their subparts. Table 4-3 summarizes the regulations and reporting requirements specified in these subparts.

4.2.2 Performance Specification Test Report Format

A standardized format for CEM performance specification test (PST) reports is recommended to enable accurate, efficient, and effective reviews. In addition, standardized reporting requirements would emphasize completeness and promote thorough and better quality PST procedures. A standardized test report format would be beneficial for both agencies and source operators.

In the paragraphs that follow, a report format is recommended. The criteria considered for its development include:

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart D - Fossil-Fuel Fired Steam Generators for Which Construction is Commenced after August 17, 1971					
Proposed/effective 8/17/71 (36 FR 15704)	Coal, coal/wood residue fired boilers >250 10^6 Btu/h	Particulate	0.10 lb/10^6 Btu	No requirement	
		Opacity	20%; 27% 6 min/h*	Continuous	EER for six-minute periods in excess of 20% opacity*
		SO_2	1.2 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 1.2 lb/10^6 Btu
		NO_x^2	0.70 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 0.7 lb/10^6 Btu
Promulgated 12/23/71 (36 FR 24876)	Oil, oil/wood residue fired boilers >250 10^6 Btu/h	Particulate	0.10 lb/10^6 Btu	No requirement	
		Opacity	20%; 27% 6 min/h	Continuous	EER for six-minute periods in excess of 20% opacity*
		SO_2	0.80 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 0.8 lb/10^6 Btu
		NO_x^2	0.30 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 0.3 lb/10^6 Btu
	Gas, gas/wood residue fired boilers >250 10^6 Btu/h	Particulate	0.10 lb/10^6 Btu	No requirement	
		Opacity	20%; 27% 6 min/h	Continuous*	EER for six-minute periods in excess of 20% opacity*
		NO_x	0.20 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 0.2 lb/10^6 Btu
	Mixed fossil fuel fired boilers >250 10^6 Btu/h	Particulate	0.10 lb/10^6 Btu	No requirement	
		Opacity	20%; 27% 6 min/h	Continuous	EER for six-minute periods in excess of 20% opacity*
		SO_2	Prorated	Continuous*	EER for three-hour periods in excess of standard
		NO_x (except lignite or 25% coal refuse)	Prorated	Continuous*	EER for three-hour periods in excess of standard
	Lignite, lignite/wood residue >250 10^6 Btu/h	Particulate	0.10 lb/10^6 Btu	No requirement	
		Opacity	20%; 27% 6 min/h	Continuous	EER for six-minute periods in excess of 20% opacity
		SO_2	1.2 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 1.2 lb/10^6 Btu
		NO_x^2 (as of 12/22/76)	0.60 lb/10^6 Btu	Continuous*	EER for three-hour periods in excess of 0.6 or 0.8 lb/10^6 Btu depending on fuel source
			0.80 lb/10^6 Btu for ND, SD, MT lignite burned in cyclone-fired unit		
			*exceptions; see §60.42(b)	*exceptions; see standards	*exceptions; see standards

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Potential Combustion Concentration	Reduction of Potential Combustion concentration, %	Monitoring Requirement	CEM Reporting Requirements
Subpart Da - Electric utility steam generating units for which construction is commenced after September 18, 1978	Boilers >73 MW (>250 10^6 Btu/h) firing solid and solid derived fuel	Particulate	13 ng/J (0.03 lb/10^6 Btu)	3000 ng/J (7.0 lb/10^6 Btu)	99	No requirement	EER for six-minute periods in excess of 20% opacity
		Opacity	20%; 27% 6 min/h			Continuous	
		SO_2	520 ng/J (1.20 lb/10^6 Btu)	See 60.48a(b)	90	Continuous	
			or				
			<260 ng/J (0.60 lb/10^6 Btu)	See 60.48a(b)	70	Continuous	
Proposed/effective 9/19/78 (43 FR 42154)		SO_2 - solvent refined coal	520 ng/J (1.20 lb/10^6 Btu)	See 60.48a(b)	85	Continuous	
Promulgated 6/11/79 (44 FR 33580)		SO_2 - 100% anthracite; non-continental	520 ng/J (1.20 lb/10^6 Btu)		Exempt	Continuous	
		NO_x-coal derived fuels; subbituminous; shale oil	210 ng/J (0.50 lb/10^6 Btu)	990 ng/J (2.30 lb/10^6 Btu)	65	Continuous	
Revised 2/6/80 (45 FR 8211) 12/1/82 (47 FR 54073)		NO_x- >25% lignite mined in ND, SD, MT, combusted in slag tap furnace	340 ng/J (0.80 lb/10^6 Btu)	990 ng/J (2.30 lb/10^6 Btu)	65	Continuous	
		NO_x- lignite; bituminous anthracite; other fuels	260 ng/J (0.60 lb/10^6 Btu)	990 ng/J (2.30 lb/10^6 Btu)	65	Continuous	

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Potential Combustion Concentration	Reduction of Potential Combustion concentration, %	Monitoring Requirement	CEM Reporting Requirements
Subpart Da(continued)	Boilers >73 MW (>250 10^6 Btu/h) firing liquid fuel	Particulate	13 ng/J (0.03 lb/ 10^6 Btu)	75 ng/J (0.17 lb/10^6 Btu)	70	No requirement	
		Opacity	20%; 27% 6 min/h			Continuous	EER for six-minute periods in excess of 20% opacity
		SO_2	340 ng/J (0.80 lb/ 10^6 Btu)	See 60.48a(b)	90	Continuous	
			or <86 ng/J (0.20 lb/ 10^6 Btu)	See 60.48a(b)	0	Continuous	
		SO_2 (non-continental)	340 ng/J (0.80 lb/ 10^6 Btu)	See 60.48a(b)	Exempt	Continuous	
		NO_x	130 ng/J (0.30 lb/ 10^6 Btu)	310 ng/J (0.72 lb/10^6 Btu)	30	Continuous	
	Boilers >73 MW (>250 10^6 Btu/h) firing gaseous fuels	Particulate	13 ng/J (0.03 lb/ 10^6 Btu)			No requirement	
		Opacity	20%; 27% 6 min/h			No requirement	
		SO_2	340 ng/J (0.80 lb/ 10^6 Btu)	See 60.48a(b)	90	Continuous*	
			or <86 ng/J (0.20 lb 10^6 Btu)	See 60.48a(b)	0	Continuous*	
		SO_2 (non-continental)	340 ng/J (0.80 lb/ 10^6 Btu)	See 60.48a(b)	Exempt	Continuous*	
		NO_x	86 ng/J (0.20 lb/ 10^6 Btu)	290 ng/J (0.67 lb/10^6 Btu)	25	Continuous	

*Except when using only natural gas.

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

	Additional CEM Reporting Requirements
Subpart D_a (continued)	For each 24-hr period: o Calendar date o Avg. Emission Rate (lb/MBtu) for SO_2/NO_x for 30 successive boiler operating days o Reason for non-compliance o Description of corrective action o % Reduction for SO_2 - 30-day rolling average o Reason for non-compliance o Corrective action taken o Identification of boiler operating days for pollutant or diluent data not obtained ($\geq$18 hrs) o Reason o Corrective action taken o Identification of all startup, downtime, malfunctions (NO_x only), emergency condition (SO_x only) o Reason for excluding data o Identification of "F" factors o Method of determination o Type of fuel combusted o Identification of times when manual sampling methods used for hourly emission values. o Identification of times when pollutant exceeded the full span o Description of modification to CEM system which effects the output.

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

	Additional CEM Reporting Requirements (continued)

Subpart D_a (continued)	o If minimum data not reported for any 30 successive boiler days,
	  o # of hours available for outlet (n_o) & inlet (n_i) emission rate
	  o Standard deviation for outlet (s_o) & inlet (s_i) emission rate
	  o Lower confidence limit outlet (E^*_o) & inlet (E^*_i)
	  o Potential combustion concentration
	  o Ratio E^*_o/E^*_{std}
	
	o If standards exceeded during emergency, submit signed statement
	  o Requirement met
	  o Time period of emergency condition
	  o Electrical output
	  o Amount of power purchased
	  o % emission reduction
	  o Atmospheric emissions
	  o Action correcting emissions
	
	o If % cleaning credit for quarter claimed, submit statement
	  o % Credit
	  o How credit determined
	  o Quantity, heat content & date each pretreatment fuel shipment was received during quarter
	  o Name/location pretreatment facility
	  o Total quantity/total heat content
	
	o For periods when opacity, sulfur dioxide, or nitrogen oxides data are unavailable, a statement of:
	  o Any changes in emission control systems during period
	  o Comparison of operation of control system and facility during period of data unavailability and operation before and after that period
	
	o Submittal of signed statement of whether
	  o CEM calibration, span, drift checks, or audits were performed
	  o Data showing compliance was obtained by approved procedures
	  o Minimum data requirements have or have not been met
	  o Minimum data requirements have not been met because of unavoidable errors
	  o Compliance with standards has or has not been achieved

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart G - Nitric Acid Plants Proposed/effective 8/17/71 (36 FR 15704) Promulgated 12/23/71 (36 FR 24876) Revised 5/23/73 (38 FR 13562) 10/15/73 (38 FR 28564) 6/14/74 (39 FR 20790) 10/6/75 (40 FR 46250) 7/25/77 (42 FR 37936) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)	Process equipment	Opacity NO_x	10% 3.0 lb/ton	No requirement Continuous Daily production rates and hours	EER for three hour periods in excess of 3.0 lb/ton
Subpart H - Sulfuric Acid Plants Proposed/effective 8/17/71 (36 FR 15704) Promulgated 12/23/71 (36 FR 24876) Revised 5/23/73 (38 FR 13562) 10/15/73 (38 FR 28564) 6/14/74 (39 FR 20790) 10/6/75 (40 FR 46250) 7/25/77 (42 FR 37936) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)	Process equipment	SO_2 Acid Mist Opacity	4.0 lb/ton 0.15 lb/ton 10%	Continuous No requirement No requirement	EER for three-hour periods in excess of 4.0 lb/ton

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart J - Petroleum Refineries					
Proposed/effective 6/11/73 (38 FR 15406) 10/4/76 (41 FR 43866)	Catalytic cracker	Particulate	1.0 lb/1000 lb (1.0 kg/1000 kg)	No requirement	
Promulgated 3/8/74 (39 FR 9308)	(with incinerator or waste heat boiler)		Additional 0.10 lb/10^6 Btu (43.0 g/MJ)	No requirement	
Revised 10/6/75 (40 FR 46250)		Opacity	30%; 6 min. exemption	Continuous	EER for one-hour periods with two or more six-minute periods in excess of 30% opacity
6/24/77 (42 FR 32426) 7/25/77 (42 FR 37936)		CO	0.05%	Continuous	EER for one-hour periods in excess of 0.05% by volume
8/4/77 (42 FR 39389) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800) 3/15/78 (43 FR 10866)	Fuel gas combustion	SO_2	0.10 gr H_2S/dscf (230 mg/dscm) fuel gas content	Continuous	EER for three-hour periods in excess of 0.10 gr H_2S/dscf
3/12/79 (44 FR 13480) 10/25/79 (44 FR 61542) 12/1/80 (45 FR 79452)	Claus sulfur recovery plants >20 LTD/day (as of 10/4/76)	SO_2	0.025% with oxidation or reduction and incineration; 0.001% H_2S or 0.03% reduced sulfur compounds with reduction only	Continuous	EER for six- or twelve-hour periods in excess of 0.025%
				Continuous	EER for twelve-hour periods in excess of 0.001% H_2S or 0.03% reduced sulfur compounds
Subpart P - Primary Copper Smelters					
Proposed/effective 10/16/74 (39FR 37040)	Dryer	Particulate	0.022 gr/dscf (50 mg/dscm)	No requirement	No requirements
		Opacity	20%	Continuous	EER for six-minute periods in excess of 20% opacity
1/15/76 (41 FR 2331)	Roaster, smelting furnace, * copper converter	Opacity	20%	No requirement	No requirements
Revised 2/26/76 (41 FR 8346) 7/25/77 (42 FR 37936) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)		SO_2	0.065%	Continuous	
	*Reverberatory furnaces that process high-impurity feed materials are exempt from SO_2 standard			Monthly record of charge and weight percent of arsenic antimony, lead and zinc	EER for six-hour period in excess of 0.065% by volume if total six-hour periods with violations (not including startups, shutdowns, or malfunctions exceed 1.5% of total six-hour periods

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirement
Subpart Q - Primary Zinc Smelters					
Proposed/effective 10/16/74 (39 FR 37040)	Sintering machine	Particulate	0.002 gr/dscf (50 mg/dscm)	No requirement	
		Opacity	20%	Continuous	EER for any six-minute period in excess of 20% opacity
Promulgated 1/15/76 (41 FR 2331)	Roaster	SO_2	0.065	Continuous	EER for any two-hour period in excess of 0.065% by volume
		Opacity	20%	No requirement	
Revised 7/25/77 (42 FR 37936) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)					
Subpart R - Primary Lead Smelters					
Proposed/effective 10/16/74 (39 FR 37040)	Blast or reverberatory furnace, sintering machine discharge end	Particulate	0.022 gr/dscf (50 mg/dscm)	No requirement	
		Opacity	20%	Continuous	EER for any six-minute period in excess of 20% opacity
Promulgated 1/15/76 (41 FR 2331)	Sintering machine,	SO_2	0.065%	Continuous	EER for any two-hour period in excess of 0.065%
	elecric smelting furnace, converter	Opacity	20	No requirement	
Revised 7/25/77 (42 FR 37936) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)					

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart Z - Ferroalloy Production Facilities					
Proposed/effective 10/21/74 (39 FR 37470) Promulgated 5/4/76 (41 FR 18497) Revised 5/20/76 (41 FR 20659) 7/25/77 (42 FR 37936) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)	Electric submerged arc furnaces	Particulate	0.99 lb/MW-h (0.45 kg/MW-h) ("high silicon alloys") 0.51 lb/MW-h (0.23 kg/MW-H) (chrome and manganese alloys)	No requirement	Reports of product change must be made within thirty days of change
			No visible emissions may escape furnace capture system	Flow rate monitoring in hood	
			No visible emissions may escape tapping system for >40% of each tapping period	Flow rate monitoring in hood	
		Opacity CO	15% 20% volume basis	Continuous No requirement	EER for six-minute periods $\geq$ 15% opacity
	Dust handling equipment	Opacity	10%	No requirement	

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart AA - Steel Plants Proposed/effective 10/21/74 (39 FR 37466) Promulgated 9/23/75 (40 FR 43850) Revised 7/25/77 (40 FR 37936) 8/17/77 (42 FR 41424) 9/7/77 (42 FR 44812) 3/3/78 (43 FR 8800) 10/31/84 (49 FR 43838)	Electric arc furnaces	Particulate	0.0052 gr/dscf (12 mg/dscm)	No requirement	
		Opacity			
		(a) control device	3%	Continuous	EER for six-minute periods ≥ 3% opacity
		(b) shop roof	0% except <20%-charging <40%-tapping	Flow rate monitoring in capture hood, pressure monitoring in DSE system	
	Dust handling equipment	Opacity	10%	No requirement	
Subpart AAa - Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 7, 1983 Proposed/effective 8/17/83 (48 FR 43838) Promulgated 10/31/84 (49 FR 43838)	Electric arc furnaces, argon-oxygen decarburization vessels, and dust handling systems in steel plants producing carbon, alloy, or specialty steels	Particulate	12 mg/dscm (0.0052 gr/dscf)	No requirement	
		Opacity			
		Control device	3%	Continuous	EER for six-minute periods ≥ 3% opacity
		Shop	6%	No requirement	

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart BB - Kraft Pulp Mills					
Proposed/effective 9/24/76 (41 FR 42012)	Recovery furnace	Particulate	0.044 gr/dscf (0.10 g/dscm) corrected to 8% oxygen	No requirement	
Promulgated 2/23/78 (43 FR 7568)		Opacity	35%	Continuous	EER for six-minute averages in excess of 35% if time period with violations are greater than 6% of total six-minute periods
Revised 8/7/78 (43 FR 34784)		TRS (a) straight recovery	5 ppm by volume corrected to 8% oxygen	Continuous	EER for twelve-hour averages in excess of 5ppm if time periods with violations are greater than 1% of total twelve-hour periods
		(b) cross recovery	25 ppm by volume corrected to 8% oxygen		EER for twelve-hour averages in excess of 25 ppm if time periods with violations are greater than 1% of total twelve-hour periods
	Smelt dissolving tank	Particulate	0.2 lb/ton (0.1 g/kg) BLS	No requirement	Note: BLS = Black Liquor Solids
		TRS	0.0168 lb/ton (0.0084 g/kg) BLS	No requirement	
	Lime kiln	Particulate (a) gaseous fuel	0.067 gr/dscf (0.15 g/dscm) corrected to 10% oxygen	No requirement	
		(b) liquid fuel	0.13 gr/dscf (0.30 g/dscm) corrected to 10% oxygen	No requirement	
		TRS	8 ppm by volume corrected to 10% oxygen	Continuous	EER for twelve-hour averages in excess of 8 ppm
	Digester, brown stack washer, evaporator, oxidation, or stripper systems	TRS	5 ppm by volume corrected to 10 oxygen*	Continuous	EER for twelve-hour averages in excess of 5 ppm
			*exceptions; see standards	Effluent gas incineration temperature, scrubber liquid supply pressure and gas stream pressure loss	Report for all periods greater than five minutes with combustion temperature less than 1200°F

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart GG - Stationary Gas Turbines	Gas turbines > 10.7 GJ/h (> 10 10^6 Btu/h)	SO_2	0.015% (150 ppm) at 15% oxygen on dry basis or fuel with <0.8% sulfur	Sulfur content of fuel	Sulfur dioxide: EER for any daily period during which sulfur content of fuel exceeds 0.8%
Proposed/effective 10/3/77 (42 FR 53782) Promulgated 9/10/79 (44 FR 52792)	Gas turbines >10.7 and <107.2 GJ/h (>10 10^6 and <100 10^6 Btu/h)*	NO_x (effective 10/3/82)	0.015% (150 ppm) at 15% oxygen on dry basis referenced to ISO standard day conditions*	Nitrogen content of fuel	Nitrogen oxides: EER for one-hour periods with (1) water-to-fuel ratio less than ratio determined to demonstrate compliance or (2) fuel-bound nitrogen of fuel greater than allowed during performance test. EER will include for each period with excess emissions: 1. Average water-to-fuel ratio 2. Average fuel consumption 3. Ambient conditions 4. Gas turbine load 5. Nitrogen content of fuel 6. Graphs or figures developed in the reference test method.
	Gas turbines >107.2 GJ/h (100 10^6 Btu/h)*	NO_x	0.0075% (75 ppm) at 15% oxygen on dry basis referenced to ISO standard day conditions*		
Revised 1/27/82 (47 FR 3767)	Gas turbines >107.2 GJ/h (100 10^6 Btu/h) used in oil/gas production or transportation not in MSA*	NO_x	0.015% (150 ppm) at 15% oxygen on dry basis referenced to ISO standard day conditions*		Ice Fog: Quarterly report for each period when exemption for ice fog is in effect. Report will include: 1. Ambient conditions 2. Date and time of control equipment deactivation 3. Date and time of control equipment reactivation
	*Emergency, military (other than garrison), military training, firefighting, R&D turbines, regenerative gas turbines <100 10^6 Btu/h, and all gas turbines (except utility) > 100 10^6 Btu/h.		*Adjustments allowed for thermal efficiency >25% or fuels with >0.015 nitrogen content	Continuous fuel consumption and water/fuel ratio if using NO_x control by water or steam injection	Emergency fuel: Report for each period when emergency fuel is used. Report will include the type, reason and duration of the firing of emergency fuel.

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart HH - Lime Manufacturing Plants					
Proposed/effective 5/3/77 (42 FR 22506)	Rotary lime kiln	Particulate	0.6 lb/ton (0.3 kg/Mg)	No requirement	
Promulgated 3/7/78 (43 FR 9452)		Opacity	15%	Continuous except when using wet scrubber; daily observation with dry control device	EER for six-minute periods in excess of 10% opacity
Revised 4/26/84 (49 FR 18076)				Mass of feed to rotary lime kiln	

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart NN - Phosphate Rock Plants					
Proposed/effective 9/21/79 (44 FR 54970)	Facilities with production capabilities >4 tons/h (3.6 Mg/h):				
Promulgated 4/16/82 (47 FR 16582)	Dryer	Particulate	0.06 lb/ton feed	No requirement	
	Calciner				
	Unbeneficiated or blend	Particulate	0.23 lb/ton feed (0.12 kg/Mg)	No requirement	
	Beneficiated	Particulate	0.11 lb/ton feed (0.055 kg/Mg)	No requirement	
	Dryer and calciner	Opacity	10%	Continuous, except when using wet scrubber	EER for six-minute periods in excess of 10% opacity
	Grinder	Particulate	0.012 lb/ton feed (0.006 kg/Mg)	No requirement	
		Opacity	0% --	Continuous, except when using wet scrubber	EER for six-minute periods in excess of 0% opacity
	Ground rock handling and storage	Opacity	0%	No requirement	
	Exempt: production or preparation for elemental phosphorus production			Wet scrubber: pressure loss and liquid supply pressure	
				Feed rate to dryer, calciner, and grinder	

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart UU - Asphalt Processing and Asphalt Roofing Manufacture	Saturator (roofing plants)	Particulate	0.04 kg/MG asphalt shingle or mineral surfaced roll roofing 0.4 kg/Mg saturated felt or smooth-surfaced roll roofing	Temperature of gas at inlet when using ESP or high velocity air filter; temperature in combustion zone when using afterburner	
		Opacity	20%		
Proposed/effective 11/18/80 (45 FR 76404) 5/26/81 (46 FR 28180)*		Visible emissions*	20%/60% min. observa- of capture system	Use of other control device requires information on operational and process parameter(s), continuous monitoring may be required	Determined by the Administrator
Promulgated 8/6/82 (47 FR 34137)	Mineral handling and storage (roofing plants)	Opacity	1%		

*Storage tank or blowing still that processes and/or stores only nonroofing asphalts.

*Exempt: Saturators constructed prior to 11/18/80 but subject through modification.

TABLE 4-3
CONTINUOUS EMISSION MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR PART 60
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (CONTINUED)

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement	CEM Reporting Requirements
Subpart UU - Asphalt Processing and Asphalt Roofing Manufacture (continued)	Asphalt storage tank (roofing or processing plants and petroleum refineries)	Opacity	0% (15 min/day exemption for blowing transfer lines)		
	Blowing still (roofing or prcessing plants and petroleum refineries)	Particulate	0.67 kg/Mg asphalt charged when catalyst added to still 0.71 kg/Mg asphalt charged when catalyst added to still and No. 6 fuel oil fired in afterburner 0.60 kg/Mg asphalt charged during blowing without catalyst 0.64 kg/Mg asphalt charged during blowing without catalyst and No.6 fuel oil fired in afterburner		
		Opacity	0% *		

*Exception when using No.6 fuel oil

(1) formal elements, such as title pages, certification pages, table of contents, etc.

(2) background information necessary to present data and results in the proper technical and regulatory perspective.

(3) sufficient data to determine the performance status of the tested monitor, and to support the test results.

The performance specifications and test procedures are described in Appendix B of 40 CFR Part 60. The performance specifications are organized according to the parameter being monitored, as follows:

- PS 1 for opacity monitors
- PS 2 for SO_2 and NOx monitors
- PS 3 for CO_2 and O_2 monitors

4.2.2.1 Performance Specification Test 1 - The PST report Table of Contents (See Figure 4-1) is an excellent outline of the recommended report format. Discussion of the information to be included in each element of the outline follows.

1. Title Page

Figure 4-2 is an example of a PST report title page. The title page should include the following: (1) the type of CEM(s) tested (in this case, opacity monitor); (2) test dates; (3) identification of the affected facility and its location; (4) regulatory agencies receiving the report; (5) the date the report was submitted; (6) identification of the organization submitting the test report.

2. Certification Page

For engineering test reports, the test team leader and a professional engineer or another engineer should verify that the report has been reviewed and is accurate. The certification page also provides the Agency reviewer with the name of a knowledgeable person to contact in the event that questions arise. A statement that the monitoring system operated within the performance specifications should also be included. Any specification not successfully met should be identified. An example of a certification page appears in Figure 4-3.

3. Table of Contents

A table of contents (See Figure 4-1) aids the reviewer in locating pertinent sections of the report. The pages of the report should be numbered.

4. Introduction

The introduction to the test report should include the purpose and background of the test. It should be brief, and the following items should also be included: (1) the name and location of the affected source; (2) a description of the source process; (3) the process production rate; (4) the fuel category; (5) an identification of the regulation(s) requiring monitoring of emissions; (6) if applicable, an identification of the state or local agency with jurisdiction over the source; (7) a discussion of pertinent pretest protocol; (8) the names of the testing firm, source, and regulatory agency observers present during the testing; (9) the types of monitors used, and their serial numbers; and (10) the dates of the operational test period, and conditioning period. Figure 4-4 provides a format for the PST report introduction.

5. Summary of Results

The summary of results is the heart of a monitor PST report. The results should be in tabular form. Interpretation and review will be greatly facilitated if the results are juxtaposed with the applicable performance specifications. Figure 4-5 illustrates an example Summary of Results for PST 1.

6. Discussion of Results

A discussion of the results should follow the summary of results. This discussion should be brief and should focus on those tests in which: (1) anamalous data were obtained, (2) departures from standard test procedures were observed, or (3) failure to meet the performance specification occurred. Possible causes for these anomalies, deviations, and/or failures should be presented and discussed.

7. Description of Source

The report should contain a brief description of the source, with emphasis on those aspects of source operation that directly affect the monitor performance test. For example, if the source is a fossil-fuel fired steam generator, then the description should address the full load heat input rate, the fuel, and the location of the monitor within the effluent handling system. The heat input rate determines the necessity for monitoring. The fuel, be it gas, oil, or coal, determines the appropriate continuous monitor span. The continuous monitor location helps to determine the representativeness of the sample. The location of the monitor (i.e., the region or point within the effluent stream where pollutant emissions are measured) should be addressed within all PST reports regardless of the source category. An example of a plant schematic is shown in Figure 4-6.

Since PST procedures can be conducted during any normal process operating conditions, any emission rate data can be assumed to represent these conditions. EPA's current emission rate data base for most source categories represents only full load, or maximum production rate conditions. Documentation of process rate, operating conditions, and control equipment status in PST reports can aid in expanding the scope of EPA's emission rate data base.

8. Monitor Description

The test report should include a description of the monitor tested. The description should identify the monitor location relative to: flow disturbances, particulate and gaseous control equipment, and the duct centerline if located in a horizontal duct. An example of a schematic appropriate for the description of a monitor location is shown in Figure 4-7. The nearest access and type of access (ladder, stairwell, etc.) should also be discussed since the March 30, 1983, promulgation of the revised PS 1 requires that this be considered when locating a monitor.

The description should also address the monitor measurement pathlength, stack exit diameter, internal span calibration filter value, output span value, and type of recorder. The recorder description should identify the integration or averaging periods used. All system component manufacturers, models, and serioa numbers should be listed. The date (month/year) the monitor was manufactured, and the serial number and date of manufacture (month/year) for the unit tested for design specification conformance should be included.

9. Discussion of Test Procedures

This section of the report should specifically discuss the test procedures used to evaluate the monitor's acceptability. For tests conducted by the manufacturer such as the spectral response, and angle of projection/view, the manufacturer should provide a description of the procedures used.

Test procedures conducted at the facility installing the monitor should be documented. The calibration error test procedures, for example, should be described in enough detail that the report reviewer can determine if the specifically required procedures were used. At a minimum, the report should state that the transmissometer was set up, off the stack, using the in-stack measurement pathlength, that calibration filters were introduced at the midpoint of the path, and that the entire measurement beam passed through the filters. Each of the individual performance specification test procedures should be discussed in similar detail. Those tests that should be addressed are:

Design Specifications

- Mean and Peak Spectral Response Test
- Angle of View/Angle of Projected Test
- Optical Alignment Site Test

Performance Specifications

- Calibration Error Test
- Response Time Test
- 24-Hour Drift Test
- 2-Hour Drift Test

The date and time all test procedures were performed should be documented including the conditioning period, and operational test period.

FIGURE 4-1. PST REPORT RECOMMENDED FORMAT: TABLE OF CONTENTS

TABLE OF CONTENTS

		Page
	Title Page	1
	Certification Page	2
	Table of Contents	3
Section 1.0	Introduction	4
Section 2.0	Summary of Results	6
Section 3.0	Discussion of Results	7
Section 4.0	Description of Source	10
Section 5.0	Description of Monitors	14
Section 6.0	Discussion of Test Procedures	22
Section 7.0	Performance Specification Test Data Sheets	30
APPENDIXES		
Appendix A.	Reference Method Raw Data	A-1
Appendix B.	Strip Chart Records	B-1
Appendix C.	Calibration Data	C-1
Appendix D.	Standard Reference Material Value Certification Documentation	D-1

FIGURE 4-2. PST REPORT RECOMMENDED FORMAT: TITLE PAGE

Performance Specification Test Report
for Tests conducted on the
CEM Monitor for Opacity

Test Dates

Name of Company

Unit, Location, State

Submitted to

US EPA
Air Enforcement Branch
Region __

Date Submitted

Submitted by:

Company Name
Street Address
City, State, Zip

FIGURE 4-3. EXAMPLE OF A CERTIFICATION PAGE FOR A PST REPORT

The results of the PST 1 Procedures and Operational Test Periods indicated that the operation of the CEM system meets PS1 requirements. We certify that we have reviewed the report and find it accurate.

name
Test Team Chief

name
Professional Engineer

FIGURE 4-4. PST REPORT RECOMMENDED FORMAT: INTRODUCTION

Section 1.0 INTRODUCTION

This report presents the results of a Performance Specification Test performed date at source company name, location. The unit tested was a coal-fired boiler designated as Unit #2. The boiler is a type rated at 110,000 lb per hour steam flow, normally operated at 200 psi steam pressure. Sections 113 and 114 of the CAA and the State SIP administered by the State Department of Air Quality require this facility to operate a CEM system. Personnel from testing firm name met with source company name and agency personnel on dates to establish the tests to be conducted and other sampling protocol. Testing firm name conducted the PST on the CEM Manufacturer, model, serial number 0000 used to monitor opacity/SO_2/NO_x. Members of the test team were _____. Regulatory agency observers from EPA and the State Department of Air Quality present for the test were _____.

FIGURE 4-5. PST 1 REPORT RECOMMENDED FORMAT:
SUMMARY OF RESULTS

	Result	Specification
Peak Spectral Response	573 nm	500 <> 600 nm
Mean Spectral Response	562 nm	500 <> 600 nm
Spectral Response Above 700 nm (percent of peak)	4%	< 10%
Spectral Response Below 400 nm (percent of peak)	0%	< 10%
Angle of Projection (degrees)	3°	$\leq$ 3°
Angle of View (degrees)	3°	$\leq$ 3°
Calibration Error: High-Range	2.1%	$\leq$ 3%
Mid-Range	0.7%	$\leq$ 3%
Low-Range	0.2%	$\leq$ 3%
Response Time	2.5 seconds	$\leq$ 10 seconds
24-Hour Zero Drift	0.3%	$\leq$ 2%
24-Hour Calibration Drift	0.4%	$\leq$ 2%

FIGURE 4-6. PST REPORT RECOMMENDED FORMAT: PLANT SCHEMATIC

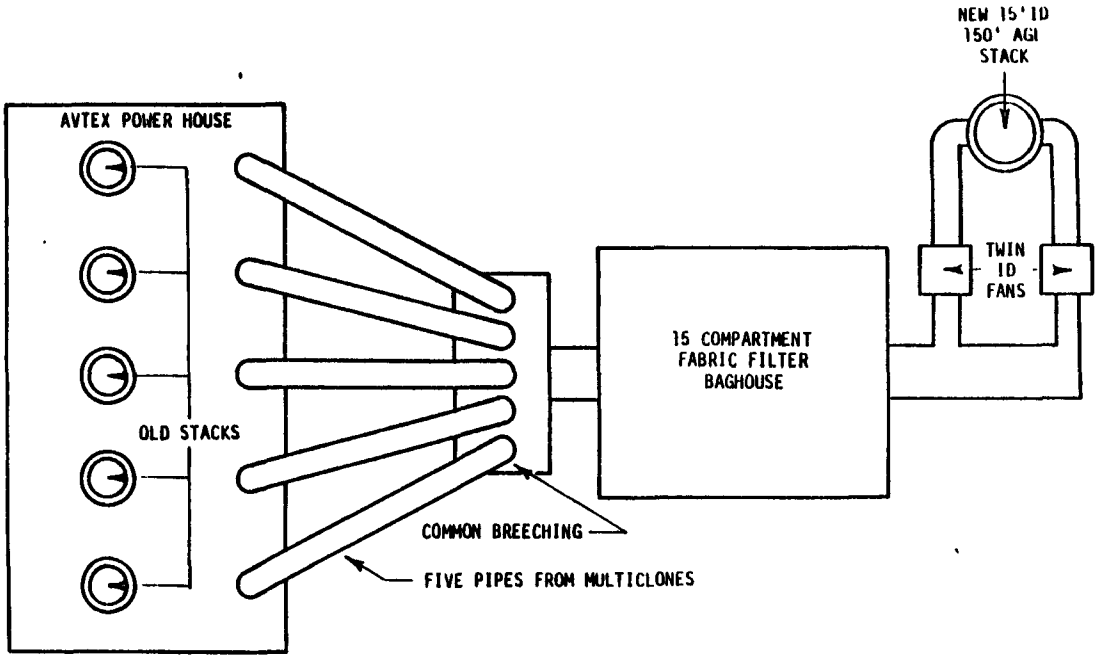
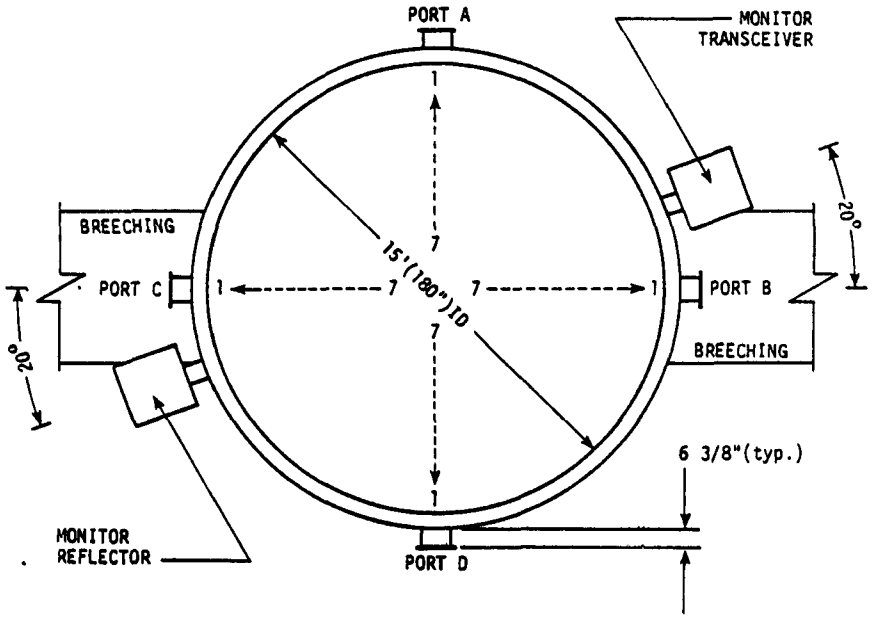


FIGURE 4-7. PST REPORT RECOMMENDED FORMAT: MONITOR LOCATION SCHEMATIC



10. Performance Testing Data Sheets

The test report should contain documentation of the following tests, as specified in Performance Specification 1:

Calibration Error Test (See Figure 4-8)
Response Time Test (See Figure 4-9)
Zero Calibration Drift Test (See Figure 4-10)

These data sheet formats are similar to those presented in 40 CFR Part 60, PS 1, Figures 1-1, 1-2, and 1-3, respectively.

11. Appendices

The test report should include in one appendix all the raw data that were recorded during the PST. In general, these raw data fall into two categories: continuous monitor data records, and data from calibration activities.

Copies of the data recorded by the continuous monitor over the entire operational test period should be included in another appendix. System recordings of calibration error, zero and optical alignment, response time, and design specification tests should be included in the appendices.

Certification of all calibration filter values should be in an appendix. This applies to filters used in calibration error tests as well as internal span filters.

Finally, a separate appendix should be included for copies of procedures cedures cited within the "Test Procedures" section.

4.2.2.2 Performance Specification Test 2 and 3 - The following discusses the contents of the various sections of a report for PST 2 and 3.

1. Title Page

The title page should include the following: (1) the type of CEM(s) tested (in this case, SO_2, NO_x, CO_2, or O_2 monitor); (2) test dates; (3) identification of the affected facility and its location; (4) regulatory agencies receiving the report; (5) the date the report was submitted; (6) identification of the organization submitting the test report. The format is the same as that presented in Figure 4-2 for PST 1 reports.

2. Certification Page

For engineering test reports, the test team leader and a professional engineer or another engineer should verify that the report has been reviewed and is accurate. The certification page also provides the Agency reviewer with the name of a knowledgeable person to contact in the event that questions arise. A statement that the monitoring system operated within the performance specifications should also be included. Any specification not successfully met should be identified. An example of a certification page appears in Figure 4-3.

FIGURE 4-8. PST 1 REPORT RECOMMENDED FORMAT:
CALIBRATION ERROR TEST

Person conducting test _____ Analyzer Manufacturer _____
Affiliation _____ Model/Serial No. _____
Date _____ Location _____
Monitor Pathlength, L_1 _____ Emission Outlet Pathlength, L_2 _____
Monitoring System Output Pathlength Corrected? Yes ___ No ___

Calibrated Neutral Density Filter Values

Actual Optical Density (Opacity):
Low-Range _____(_____)
Mid-Range _____(_____)
High-Range _____(_____)

Path Adjusted Optical Density (Opacity):
Low-Range _____(_____)
Mid-Range _____(_____)
High-Range _____(_____)

Run Number	Calibration Filter Value (Path-Adjusted Percent Opacity)	Instrument Reading (Opacity), percent	Arithmetic Difference (Opacity), percent		
			Low	Mid	High
1-Low				-	-
2-Mid			-		-
3-High			-	-	
4-Low				-	-
5-Mid			-		-
6-High			-	-	
7-Low				-	-
8-Mid			-		-
9-High			-	-	
10-Low				-	-
11-Mid			-		-
12-High			-	-	
13-Low				-	-
14-Mid			-		-
15-High			-		
		Arithmetic Mean			
		Confidence Interval			
		Calibration Error			

FIGURE 4-9. PST 1 REPORT RECOMMENDED FORMAT: RESPONSE TIME DETERMINATION

Person Conducting Test _____ Analyzer Manufacturer _____

Affiliation _____ Model/Serial No. _____

Date _____ Location _____

High Range Calibration Filter Value: Actual Optical Density (Opacity) _____(_____)

Path Adjusted Optical Density (Opacity)_____(_____)

Upscale Response Value (0.95 x filter value)_____percent opacity

Downscale Response Value (0.05 x filter value)_____percent opacity

Upscale	1 _____	seconds
	2 _____	seconds
	3 _____	seconds
	4 _____	seconds
	5 _____	seconds
Downscale	1 _____	seconds
	2 _____	seconds
	3 _____	seconds
	4 _____	seconds
	5 _____	seconds
Average response	_____	seconds

Figure 4-10. PST 1 REPORT RECOMMENDED FORMAT:
ZERO CALIBRATION DRIFT TEST

Person Conducting Test _____ Analyzer Manufacturer _____
Affiliation _____ Model/Serial No. _____
Date _____ Location _____

Monitor Pathlength, L_1 _____ Emission Outlet Pathlength, L_2 _____
Monitoring System Output Pathlength Corrected:? Yes _____ No _____
Upscale Calibration Value: Actual Optical Density (Opacity) _____(_____)
Path Adjusted Optical Density (Opacity) _____(_____)

			Percent Opacity									Alignment	
Date	Time		Zero Reading*		Zero Drift		Upscale Calibration Reading		Upscale Drift	Calibration Drift			
	Begin	End	Initial A	Final B	C=B-A		Initial D	Final E	F=E-D	G=F-C**			
Arithmetic Mean (Eq. 1-2)													
Confindence Interval (Eq. 1-3)													
Zero Drift										Calibration Drift			

*without automatic zero compensation
**if zero was adjusted (manually or automatically) prior to upscale check, then use c=0.

3. Table of Contents

A table of contents (See Figure 4-1) aids the reviewer in locating pertinent sections of the report. The pages of the report should be numbered.

4. Introduction

The introduction to the test report should include the purpose and background of the test. It should be brief, and the following items should also be included: (1) the name and location of the affected source; (2) a description of the source process (e.g., fossil-fuel fired steam generator); (3) the process production rate (e.g., MW); (4) the fuel category (e.g., bituminous coal); (5) an identification of the regulation(s) requiring monitoring of emissions; (6) if applicable, an identification of the state or local agency with jurisdiction over the source; (7) a discussion of pertinent pre-test protocol; (8) the names of the testing firm, source, and regulatory agency observers present during the testing; (9) the types of monitors used (manufacturer and model); and (10) the dates of the operational test period.

5. Summary of Results

The summary of results is the heart of a monitor test report. It should be in tablular form. If the results are juxtaposed with the applicable performance specifications, interpretation and review will be greatly facilitated. Figure 4-11 illustrates an example Summary of Results for PST 2 or 3.

6. Discussion of Results

A discussion of the results should follow the summary of results. This discussion should be brief and should focus on those tests in which: (1) anomalous data were obtained, (2) departures from standard test procedures were observed, or (3) failure to meet the performance specification occurred. Possible causes for these anomalies, deviations, and/or failures should be presented and discussed.

7. Description of the Source

The report should contain a brief description of the source, with emphasis on those aspects of source operation that directly affect the monitor performance test. For example, if the source is a fossil fuel-fired steam generator, then the description should address the heat input rate, the fuel, and the location of the monitor within the effluent handling system. The heat input rate determines the necessity for monitoring. The fuel, be it gas, oil, or coal, determines the appropriate continuous monitor span. The CEM location helps to determine the representativeness of the sample. The location of the monitor (i.e., the region or point within the effluent stream where pollutant emissions are measured) should be addressed within all PST reports regardless of the source category.

FIGURE 4-11. PST 2 AND 3 REPORT RECOMMENDED FORMAT: SUMMARY OF RESULTS

	Result	Specification
SO_2 Monitor		
Relative Accuracy	15%	< 20%[1]
24-Hour Calibration Drift	1.0%	≤ 2.5%
Operational Test Period	June 1-7, 1982	≥ 168 h
NO_x Monitor		
Relative Accuracy	17%	≤ 20%
24-Hour Calibration Drift	0.6%	≤ 2.5%
Operational Test Period	June 1-7, 1982	≥ 168 h
O_2 Monitor		
Relative Accuracy	0.6% O_2	≤ 20%[2]
24-Hour Calibration Drift	0.1% O_2	≤ 0.5% O_2
Operational Test Period	June 1-7, 1982	≥ 168 h
CO_2 Monitor		
Relative Accuracy	0.6% O_2	≤ 20%[2]
24-Hour Calibration Drift	0.1% O_2	≤ 0.5% O_2
Operational Test Period	June 1-7, 1982	≥ 168 h

[1]The relative accuracy of the CEMs must be no greater than 20% of the mean value of the Reference Method test data in terms of the units of the emission standard or 10% of the applicable standard, whichever is greater. For SO_2 emission standards between 130 and 86 ng/J (0.30 and 0.20 lb/MBtu), use 15% of the emission standard.

[2]The relative accuracy of the CEMs must be no greater than 20% of the the mean value of the Reference Method test data or 1.0% O_2 or CO_2, whichever is greater.

Since PST procedures can be conducted during any normal process operating conditions, any emission rate data can be assumed to represent these conditions. EPA's current emission rate data base for most source categories represents only full load, or maximum production rate conditions. Documentation of process rate, operating conditions, and control equipment status in PST reports can aid in expanding the scope of EPA's emission rate data base.

8. Monitor Description

The test report should include a brief description of the monitors tested. This is important because, as applied, PST procedures are generally monitor specific. For example, the calibration error tests for extractive and in-situ monitors differ radically. Extractive monitors require injection of calibration gases, while in-situ monitors require the use of cells containing calibration gases. Another example is the measurement basis of the monitor. Moisture measurements must be performed concurrently with reference method determinations during relative accuracy testing of wet basis pollutant gas monitors.

The monitor description should include the following information: (1) the make and model of the monitor; (2) the analytical measurement process (e.g., infrared, second derivative ultraviolet, galvanic concentration cell); (3) the moisture basis (wet or dry); (4) the measurement mode (extractive or in-situ); and (5) the method employed for calibration.

The test report should contain a drawing that illustrates the general locations and relative positions of the monitors and the reference method sampling probe(s) within the effluent handling system (a schematic similar to the one shown for an opacity CEM in Figure 4-6 is appropriate). The drawing will aid the reviewer examining anomalous data and establish that the sites for monitoring and sampling were chosen properly.

The recorder description should identify the integration or averaging periods used. All system component manufacturers, models, and serial numbers should be listed. The manufacturer, the serial number, and the date (month/year) the monitor was manufactured should also be included.

9. Discussion of Test Procedures

The test report should include a section that discusses the procedures employed during the PST. The discussion should be brief and should emphasize those parts of the test for which no established procedures exist and/or those parts of the test in which deviations from established testing procedures occurred. Specific descriptions of all procedures, including those performed according to the specifications, should be included. Several examples of procedures that should be discussed are provided below.

When concentrations for calibration gases are determined using the reference methods, procedures for sampling gas cylinders should be described. This is particularly true for Methods 6 and 7 because these methods do not

directly apply to high pressure samples. The pertinent sampling procedures should be discussed within the "Test Procedures" section of the report, or a reference for the procedures should be cited. In the latter case, it would be helpful to include within the report's appendixes a copy of the citation. An analogous example would be the documentation of the method used for determining effluent moisture, if relative accuracy testing were performed for a wet-basis CEM. Since Performance Specification 2 does not prescribe a method for determining moisture, testers may choose among several methodologies. If Reference Method 4 were not used, then the tester must provide a description and discussion of the method employed in the test report. In this regard, Performance Specification 2 explicitly states that the method used for determining moisture and the calculation procedures employed for correcting between differing measurement bases (e.g., wet-basis or dry-basis) are to be reported.

Performance Specification 2 requires the reporting of the method used for obtaining the CEM's concentration data for the relative accuracy computation. Therefore, a description of this method should be included within the "Test Procedures" section of the test report. Descriptions of monitor-specific PST procedures should also be included within the "Test Procedures" section. Two such monitor-specific aspects of the PST are:

1. the pressure and flow rates for calibration gas injections.

2. the use of mixed calibration gases, e.g., SO_2 and O_2 in nitrogen, for monitors that have dual analysis capability.

Finally, the "Test Procedures" section should address all deviations from the reference methods that occurred during the performance program. In this regard, the introductory paragraphs of 40 CFR Part 60, Appendix A, state:

> ". . . an owner electing to use . . . techniques (cited as "subject to the approval of the Administrator" or as "or equivalent") is responsible for . . . (2) including a written description of the alternative method in the test report (the written method must be clear and must be capable of being performed without additional instruction, and the degree of detail should be similar to the detail contained in the reference methods); and (3) providing any rationale or supporting data necessary to show the validity of the alternative in the particular application."

10. Performance Test Data Sheets

The test report should, as appropriate, contain documentation of the following tests, as specified in Performance Specification 2 and 3.

- Analysis of Calibration Gases (Figure 4-12)
- Zero Calibration and Drift (24 Hour) (Figure 4-13)
- Relative Accuracy Determination (Figure 4-14)

These data sheets are similar to those presented in 40 CFR Part 60, PS 2 and 3.

FIGURE 4-12. PST 2 AND 3 REPORT RECOMMENDED FORMAT: ANALYSIS OF CALIBRATION GAS MIXTURE

GAS: ____ SO_2 ____ NO_x ____ O_2 ___ CO_2

DATE_____ REFERENCE METHOD_____

MID-RANGE CALIBRATION GAS MIXTURE

Sample 1 _____ppm/%

Sample 2 _____ppm/%

Sample 3 _____ppm/%

AVERAGE _____ppm/%

HIGH-RANGE (SPAN) CALIBRATION GAS MIXTURE

Sample 1 _____ppm/%

Sample 2 _____ppm/%

Sample 3 _____ppm/%

AVERAGE _____ppm/%

FIGURE 4-13. PST 2 AND 3 REPORT RECOMMENDED FORMAT: ZERO AND CALIBRATION DRIFT

(24 HOUR)

Date and Time	Zero Reading	Zero Drift (Zero)	Span Reading (After Zero Adjustment)	Calibration Drift (Span)

Zero Drift = [Mean Zero Drift* _____ + CI (Zero) _____]÷(Instrument Span) x 100 = _____

Calibration Drift = [Mean Span Drift* ___ + CI (Span) _____]÷(Instrument Span) x 100 =____

* Absolute Value.

FIGURE 4-14.
PST 2 & 3 REPORT RECOMMENDED FORMAT
RELATIVE ACCURACY DETERMINATION

Run No.	Date and Time	SO_2[e]			NO_x[be]			CO_2 or O_2[ae]			SO_2[a]			NO_x[a]		
		RM	M	Diff	RM	M	Diff	RM	M	Diff	RM	M	Diff	RM	M	Diff
		ppm[d]			ppm[d]			%[d]			mass/GCV			mass/GCV		
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
Average																
Confidence Interval																
Accuracy[c]																

[a]For steam generators.

[b]Average of 3 samples.

[c]Use average of reference method test results for Relative Accuracy.

[d]Make sure that RM and M data are on a consistent basis, either wet or dry.

[e]Not required if applicable standard is diluent corrected.

11. Appendices

The test report should include all the raw data used in the PST. In general, these raw data fall into three categories: data from reference method (and moisture) testing, continuous monitor data records, and data from calibration activities.

The reference method (and moisture) raw data should be assembled in one appendix and, as appropriate, should include: sampling data for SO_2, NO_x, and H_2O, and analysis data for SO_2 and NO_x.

Copies of the data recorded by the continuous monitor over the entire operational test period should be included in another appendix.

All calibration data should be included in a separate appendix. These calibration data may derive from pre- to post-test dry gas meter calibrations, thermometer calibrations, and sampling and analysis of SO_2, NO_x, CO_2, and O_2 calibration gases.

A separate appendix should be included for copies of procedures cited within the "Test Procedures" section.

All calibration reference material (gas cylinders, gas cells) certification documentation should be included in the appendices.

4.3 EMISSION TEST REPORT

Each NSPS or NESHAP contains some form of pollutant emission limit and a test method to determine compliance with this limit. This determination must be made shortly after initial startup and a written report of the results must be submitted. Specific standards, especially NESHAP, often require more frequent or additional testing and reporting. In most cases, the general rule is ". . . a written report of the results of such performance test(s). . ." must be submitted to the Administrator. The performance test report is the primary, and often only, written documentation that the source operator has fulfilled the testing requirements of the standard.

Most compliance determinations are measurements of the discharge to the atmosphere. This section will address basically these activities, and not work practice, control device, or material-input type standards. Some emission standards (e.g., primary aluminum reduction) contain specific types of reports or data to be included in the performance test report. Each test method has certain key elements that are used to evaluate the acceptability of the testing. The tester and report writer should be sure that the report includes those elements which are specific to the source and test method.

4.3.1 Regulatory Requirements

The basic requirement is that a written report be submitted and results reported in terms of the applicable standard.

Tables 4-4 and 4-5 identify the reference test method for each NSPS and NESHAP source category along with highlights of additional requirements contained in the standards. Each test method contains procedures for sampling, analysis and calculations and contains criteria for acceptance of the results, e.g., isokineticity for Method 5. The additional requirements are either necessary to calculate compliance or to verify proper process operations.

4.3.2 Report Format

Table 4-6 presents the contents of a complete performance test report in outline form. Most of the items in the outline are in one of these five catagories:

1. specifically required by the test methods or standards;

2. necessary, although not specifically required, to ensure that proper procedures were followed;

3. necessary to permit thorough understanding and review of the procedures;

4. desirable for establishing process operating conditions or sampling representativeness; or

5. necessary from a legal aspect.

The outline is followed by a section-by-section narrative of the report contents that briefly describes the report section and identifies, where possible, elements of the report required by the test method or standards.

The following describes the contents of a complete report. Depending on the test situation, report elements can be combined to avoid repetition of information presented in another element, or the organization can be rearranged.

1. Introduction

The introduction should provide the reader with the who, what, when, where and why of the test and describe briefly the report contents. The narrative should include identification of the source and facility, applicable regulations and pollutants measured, reason for the test, names and affiliations of the test team, observers, and plant contact. The sampling and analytical procedures should be referenced. A brief process description may be desirable for those readers not concerned with the process description detail in Element III of the test report. Figure 4-15 is an example of an Emission Test Report introduction.

2. Summary of Results

The test summary presented in Figure 4-16 is an example of the results from a coal-fired boiler. Note that the summary includes process operation information in addition to emission test data.

TABLE 4-4. NSPS PERFORMANCE TEST REQUIREMENTS
40 CFR Part 60
(REFERENCE TEST METHODS)

Subpart	Source Category	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	19	20	22	24	25
D	Fossil Fuel Boilers	X		X		X	X	X														
Da	Electric Utility Boilers	X		X		X											X	X				
E	Municipal Incinerator	X	X	X		X																
F	Portland Cement Plants	X	X	X		X				X												
G	Nitric Acid Plants	X	X	X				X		X												
H	Sulfuric Acid Plants	X	X	X					X	X												
I	Asphalt Concrete Plants	X	X	X		X				X												
J	Petroleum Refineries	X	X	X	X	X	X				X	X			X							
K	Petroleum Liquid Storage																					
Ka	Petroleum Liquid Storage																					
L	Secondary Lead Smelters	X	X	X		X				X												
M	Secondary Brass and Bronze	X	X	X		X				X												
N	Iron & Steel Plants BOF	X	X	X		X				X												
O	Sewage Treatment Plants	X	X	X		X																
P	Primary Copper Smelters	X	X	X		X																
Q	Primary Zinc Smelters	X	X	X		X																
R	Primary Lead Smelters	X	X	X		X																
S	Primary Aluminum Reduction	X	X	X						X			X	X								
T	Phosphoric Acid Plants																					
	Wet Process	X	X	X									X									
U	Super Phosphoric Acid Plants	X	X	X									X									
V	Diammonium Phosphate	X	X	X									X									
W	Triple Super Phosphate	X	X	X									X									
X	Granulated Triple Super												X									
	Phosphate Storage	X	X	X									X									
Y	Coal Preparation Plants	X	X	X		X				X												
Z	Ferroallory Production	X	X	X		X				X												
AA	Electric Arc Furnaces	X	X	X		X				X												
AAa	EAFs and Argon-Oxygen																					
	Decarburization Vessels	X	X	X		X				X												
BB	Kraft Pulping	X	X	X		X				X						X	X					
CC	Glass Manufacturing	X	X	X		X																
DD	Grain	X	X	X		X				X							X					
EE	Surface Coating: Metal	X	X																		X	X
	Furniture																					

(continued)

TABLE 4-4. NSPS PERFORMANCE TEST REQUIREMENTS (continued)
40 CFR Part 60
(REFERENCE TEST METHODS)

Subpart	Source Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	24	25
GG	Stationary Gas Turbines																			X				
HH	Lime Manufacturing	X	X	X	X	X				X														
KK	Lead-Acid Battery Manufacturing	X	X		X								X											
LL	Metallic Mineral Processing	X	X	X		X				X														
MM	Surface Coating: Automobiles & Light Duty Trucks	X	X	X	X															X			X	
NN	Phosphate Rock Plants	X	X	X		X				X														
PP	Ammonium Sulfate	X	X	X		X				X														
QQ	Graphic Arts: Rotogravure																						X	
RR	Surface Coating: Pressure Sensitive Tape & Label	X	X	X	X																		X	X
SS	Surface Coating: Large Appliances	X	X	X	X																		X	X
TT	Surface Coating: Metal Coil	X	X	X	X																		X	X
UU	Asphalt Processing and Roofing	X	X	X		X				X												X		
VV	Equipment Leaks of VOC in Synthetic Organic Chemical Manufacturing		X																		X	X		
WW	Surface Coating: Beverage Can	X	X	X	X																		X	X
XX	Bulk Gasoline Terminals		X																		X			X
FFF	Flexible Vinyl and Urethane Coating and Printing	X	X	X	X																		X	X
GCG	Equipment Leaks of VOC in Petroleum Refineries		X																		X	X		
HHH	Synthetic Fiber Production																							
JJJ	Petroleum Dry Cleaners																							

TABLE 4-4. NSPS PERFORMANCE TEST REQUIREMENTS (Continued)
40 CFR Part 60

Subpart	Source Category	Additional Analysis: Raw Mat'ls.	Product	Fuel	Gas, Liquid Waste	Process/Control Monitoring Data	Comments
D	Fossil Fuel Boilers			X		Fuel Burning Rate	For F factor, Not Reg
Da	Electric Utility Boilers					Method 19 Data	
E	Municipal Incinerator	X				Charge Rates/Op hrs	Scrubber Inlet CO_2, H
F	Portland Cement Plants	X	X			Kiln Feed/Prod Rate	Confirm by Mat Bal
G	Nitric Acid Plants		X			Acid Prod/Mat Bal	CEM-Conversion Factor
H	Sulfuric Acid Plants		X			Acid Prod/Mat Bal or Alt	CEM-Conversion Factor
I	Asphalt Concrete Plants						
J	Petroleum Refineries			X	X	Coke Burn Off	
K	Petroleum Liquid Storage		X				
Ka	Petroleum Liquid Storage		X				Gap Areas & Gap Widths of 1°, 2° Seals
L	Secondary Lead Smelters						
M	Secondary Brass and Bronze						
N	Iron & Steel Plants BOF					Prod Cycle/Exhst Diversn	
O	Sewage Treatment Plants	X				Sludge Feed Rate	Mass Municipal Waste
P	Primary Copper Smelters	X				SO_2, Opacity CEM	
Q	Primary Zinc Smelters					SO_2, Opacity CEM	
R	Primary Lead Smelters					SO_2, Opacity CEM	
S	Primary Aluminum Reduction					Al & Anode Prod, Feed Rate	Control Equip Report
T	Phosphoric Acid Plants Wet Process	X				Feed Rate, Scrubber Press	
U	Superphosphoric Acid Plants	X				Feed Rate, Scrubber Press	
V	Diammonium Phosphate	X				Feed Rate, Scrubber Press	
W	Triple Superphosphate	X				Feed Rate, Scrubber Press	
X	Granulated Triple Super Phosphate Storage					Feed Rate, Scrubber Press, Storage Record	
Y	Coal Preparation Plants					Dryer Exit Temp, Scrubber Press, H_2O Press	
Z	Ferroallory Production					Open Hood Area, Furnace Power	
AA	Electric Arc Furnaces					Hood Flow Rate, Furnace Press	
AAa	EAF's and Argon-Oxygen Decarburization Vessels					Hood Capture, Furnace Press	
BB	Kraft Pulping				X	Black Liquor Solids Feed Rate, Incineration Temp, Scrubber Press, H_2O Press	
CC	Glass Manufacturing					Glass Prod Rate, Fuel Rates	
DD	Grain						
EE	Surface Coating: Metal Furniture	X				Solvent Recovery, Incineration Temp	

(continued)

TABLE 4-4. NSPS PERFORMANCE TEST REQUIREMENTS (Continued)
40 CFR Part 60

Subpart	Source Category	Additional Analysis: Raw Mat'ls.	Product	Fuel	Gas, Liquid Waste	Process/Control Monitoring Data	Comments
GG	Stationary Gas Turbines			X		H_2O to Fuel Ratio, Combustor Press, etc.	
HH	Lime Manufacturing	X				Feed Rates	
KK	Lead-Acid Battery Manufacturing					Lead Feed Rates	
LL	Metallic Mineral Processing					Scrubber Press, H_2O Press	
MM	Surface Coating: Automobiles and Light Duty Trucks						
NN	Phosphate Rock Plants					Feed Rate	
PP	Ammonium Sulfate					Feed Rate	
QQ	Graphic Arts: Rotogravure	X					
RR	Surface Coating: Pressure Sensitive Tape and Label	X				Solvent Recovery and Use, Incineration Temp, Hood Oper	
SS	Surface Coating: Large Appliances	X					Mass of VOC's Emitted Control Device Reduction Effic
TT	Surface Coating: Metal Coil	X				Incineration Temp	Control Device Destruction Effic
UU	Asphalt Processing and Asphalt Roofing					Prod Rates, Inlet Gas Temp	
VV	Equipment Leaks of VOC in Synthetic Organic Chemical Manufacturing						Routine Monitoring Used
WW	Surface Coating: Beverage Can	X				Incineration Temp	Capture Effic, Destruction Effic
XX	Bulk Gasoline Terminals					Vapor Collection System Press	
FFF	Flexible Vinyl and Urethane Coating and Printing	X					
GGG	Equipment Leaks of VOC in Petroleum Refineries						Routine Monitoring Used
HHH	Synthetic Fiber Production					Total Solvent Feed	
JJJ	Petroleum Dry Cleaners					Recovered Solvent Flow Rate	

TABLE 4-5. NESHAP PERFORMANCE TEST REQUIREMENTS
40 CFR Part 61
(Reference Test Methods)

Subpart	Source Category	2	21	22	101	101A	102	103	104	105	106	107	107A	Other
C	Beryllium							X	X					Ambient air sampling
D	Beryllium Rocket Motor Firing							X						Ambient air sampling
E	Mercury				X[1]	X[2]	X[1]			X[2]				Sludge samples
F	Vinyl Chloride										X	X	X	Wastewater samples
J	Equipment Leaks of Benzene													Comply with Subpart V
M	Asbestos													Control equipment reporting requirements
V	Equipment Leaks	X	X	X										Monitor flare pilot flame

[1]Chlor-alkalai plants
[2]Sewage sludge incinerators

TABLE 4-6. BASIC OUTLINE OF AN EMISSION TEST REPORT

i. Cover - Plant name, location, source; testing organization, report date
ii. Abstract - Highlights of each report section
iii. Table of Contents
iv. Certification - Field team leader

I. Introduction
  A. Test purpose, location, source name, regulation
  B. Test dates, test team members, observers
  C. Test methods, pollutants, data collection responsibilities

II. Summary of Results
  A. Emission rates, concentrations
  B. Process feed rates, analysis results
  C. Allowable emissions
  D. Description of calculation procedures

III. Process Description
  A. Plant details
  B. Source details
    1. Process design data
    2. Control equipment design data
    3. Flow diagram
  C. Test Operating Data
    1. Required compliance data
    2. Calculation procedures
    3. Other required process data
    4. Demonstration of required operation
    5. Data to establish baseline or compliance conditions

IV. Sampling Sites
  A. Physical location and process orientation of sample collection points
  B. Rationale for site selection
  C. Procedures for correction/calculation of results or methods due to sample site consideration
  D. Process and fuel sample collection sites

V. Sample Collection Procedures
  A. Sample collection train description
    1. Schematic diagram
    2. Deviations from specifications
    3. Supportive data for equivalency
  B. Pre-Test Preparations
    1. Assembly, leak checks
    2. Process verification
  C. Sample Collection
    1. Chronology
    2. Deviation from intended procedures, intentional or unintentional
    3. System operating characteristics

TABLE 4-6. BASIC OUTLINE OF AN EMISSION TEST REPORT (Continued)

D. Post-Test Activities
   1. Sample recovery procedures
   2. Field checks of data
   3. Sample identification and logging

VI. Sample Analysis
A. Pre-Test Procedures
   1. Reagent procurement, preparation
B. Sample Analysis
   1. Reference to published procedures
   2. Highlights of analytical steps
   3. Specific equipment
   4. Calculation of results
   5. Deviation from accepted procedures

VII. Quality Assurance
A. Sampling
   1. Pre-test calibrations, equipment check out
   2. Field checks of calibrations
   3. Operating procedures during test
   4. Post-test leak checks, drift
B. Analysis
   1. Field and laboratory blanks
   2. Sample spikes
   3. Duplicate or replicate analysis
   4. Contamination prevention
   5. Sample recovery
   6. Precision and accuracy
C. Data Handling
   1. Error checks
   2. Statistical analysis
   3. Proofreading
   4. Chain of custody

VIII. Detailed Results
A. Emission Data - typical parameters
   1. Pollutant emission data
   2. Exhaust gas parameters
   3. Sampling variables
   4. Analytical results
B. Process Data
   1. Individual data points
   2. Analysis results
C. Calculations
   1. Example calculation
   2. Miscellaneous

IX. Conclusions
Appendices
A. Raw Field Data Sheets
B. Raw Analytical Data

TABLE 4-6. BASIC OUTLINE OF AN EMISSION TEST REPORT (Continued)

C. Complete Calculated Results and Example Calculation
D. Calibration Data Procedures
E. Detailed Sampling and Analytical Procedures
F. Raw Process Data
G. Test Log
H. Chain of Custody Records

FIGURE 4-15. EMISSION TEST REPORT RECOMMENDED FORMAT: INTRODUCTION

INTRODUCTION

Test firm name received Task Order/Contract from the Air Enforcement Branch, Region V, U.S. Environmental Protection Agency (U.S. EPA), to conduct particulate emission compliance testing at Source-Company name, coal-fired steam generating facilities in location. These tests were performed to determine the units' compliance status with respect to the regulations.

During the period of dates, a total of six particulate emission rate runs and four particle sizing runs were conducted at the _____ plants. Samples were collected in accordance with the procedures specified in U.S. EPA Reference Methods 1-5, (40 CFR, Part 60, Appendix A), except as discussed in Section 3.

Results of the test runs are compiled in this report and particulate emission rates are presented as a mass emission rate and mass per unit of heat input. Mass per unit of heat input emission rates were calculated using an "F" factor value determined from the ultimate analysis of coal samples collected at the various sites, and from process data taken during the testing.

Personnel from the _____ office of EPA conducted visible emissions observations during some of the testing. The test firm name test crew was composed of test team names. Source-Company name personnel provided assistance to the test team.

FIGURE 4-16.
EMISSION TEST REPORT RECOMMENDED FORMAT:
SUMMARY OF RESULTS

SUMMARY OF EMISSION TEST RESULTS
BOILER NO. 2

	RUN M5-2	RUN M5-3	RUN M5-4	RUN M5-5
Particulate Emissions Based on "F" factor, lb/10^6 Btu	0.18	0.12	0.26	0.16
Gross Heat Input, 10^6 Btu/h	107.9	115.1	117.4	119.8
Allowable Emissions, lb/10^6 Btu	0.058	0.057	0.057	0.057
Particulate Emissions, lb/hr (1)	18.9	14.2	30.2	19.5
Particulate Emissions, lb/hr (2)	19.4	13.8	30.5	19.2
Average Steam Production lb/hr (3)	107,000	108,000	108,000	110,000
Stack Gas Flow Rate, scfm (4)	32,999	32,162	37,730	33,285
Stack Gas Temperature, °F	447	451	416	441
Oxygen, %	9.7	9.9	10.3	10.3
Isokinetic, %	96.8	99.9	95.7	98.2

(1) Results based on front half catch, ref: 40 CFR Part 60, Appendix A, Method 5.
(2) Based on particulate concentration of row 1 and heat input of row 2.
(3) Based on Steam Integrator readings supplied by Power Plant personnel.
(4) Standard cubic feet per minute at 68°F and 29.92 in. Hg, dry basis.

3. Process Description

The report should reflect the importance of the data in establishing compliance and operating conditions during the tests. It should provide the reader with an understanding of how the process unit relates to the whole operation, what the criteria for normal performance are, and especially, the data necessary to ascertain compliance. Salient points are highlighted as follows:

Plant Details - Give the name and location of plant; contact people, names and titles; and type of plant.

General Facility - Provide a narrative about the process unit involved and its relationship to the plant as a whole. Include:

- Design data- raw material inputs, product outputs, internal flows, temperatures, design or maximum load criteria as appropriate for the facility, operating schedule.
- Control device data- design characteristics, e.g., gas flow rate, pressure drop, temperature, L/G ratio.
- A flow diagram, either block or schematic

Operating Data During Test - report the data collected during the individual test runs. Typical types of data are:

- Compliance data - the necessary data to calculate total compliance with regulations, e.g., mass feed rate, equivalent P_2O_5, phosphorus analysis for phosphate fertilizer sources.

- Other required data - e.g., the analysis of smelter feeds for arsenic lead, antimony, and zinc.

- Baseline data - sufficient data related to system operating conditions and variations to describe the circumstances under which the samples were obtained.
  a. Process
  b. Control equipment

  Example: Rotary kiln with venturi scrubber kiln data - hot and cold end temperatures, feed flow rate and percent solids, kiln rotation speed, fuel burning rate (heating value, ash, sulfur).

  Scrubber data- overall and venturi pressure drop, recirculation rate, makeup rate, pH of liquid streams, venturi throat position, inlet gas temperature, fan speed and current.

4. Sampling Sites

Describe the physical and process location of sampling sites. Show that the location meets the acceptance criteria, e.g., Method 1. Show

the location with respect to other process streams, e.g., identify in and out leakages, and other confluent streams. Discuss the representativeness of the chosen site, alternate sites considered, and reasons for not choosing the alternates. Any correction or calculation procedures should be mentioned, e.g., a molecular weight determination and subsequent correction of results for a municipal incinerator. The means and places of obtaining fuel or process samples for subsequent analysis should be described with identification and highlights of standard procedures (e.g., ASTM, API, APHA).

5. Sample Collection Procedures

This is a narrative description of equipment and activities employed to collect the samples. Most freqently it is a one-sentence statement that a given reference method was used. However, if non-standard procedures were used, a verbatim transcript of the method is required. Any deviations from the accepted procedures must be mentioned. Present a schematic diagram of the major sampling train components with a narrative description identifying any deviations from the specified equipment. If required, supportive data about the equivalency of the equipment or procedures should be presented here. In some cases, the methods require a demonstration. The pre-test preparation procedures used should be described. Some examples are:

- System assembly and leak check
- Instrument zero, span, calibration
- Check of process parameters and gas characteristics against expected or desired values.

Describe applicable sampling procedures from reference methods used for this particular test. This description should include a chronology with dates and times, run designations, and sampling system operating characteristics, if applicable. Replacement of reagents or components, interruption of sample collection, and zero, span, calibration during sampling should be stated. Deviations from specified procedures, intentional or unintentional, must be discussed. The post-test activities and sample recovery from the applicable procedures of the reference methods are also described as used for this test. Post-test sampling equipment checks (on-site), leak checks, equipment inspection, and calibration spot checks are included, as well as, sample train clean-up and removal of collected sample, transport, and/or preparation for shipping. Other items to be presented are preparation of field blanks, if appropriate, identification and logging of samples, and field checks. Field calculations of sample collection validity such as isokineticity, reagent absorbing efficiency, inspection of moisture traps or desiccant columns, and converter efficiency checks should be discussed.

6. Sample Analysis

This discussion should contain all analytical procedures used in generating the results, appending copies of standard written methods and

including the highlights and changes or modifications. Describe the pre-test preparations. This should include a discussion of reagent preparation and standardization; filter media numbering and taring; handling, shipping, and logging of reagents and collection media; and calibration of laboratory and field analytical instruments.

Most of these procedures are described in detail in the applicable references; thus this subsection need not contain all steps of the analysis used. The important ones should be highlighted, any deviations from the norm noted, and appropriate intermediate results (e.g., specific calibration curves) indicated. Examples of the information to be shown are:

- Pre-analysis sample treatment - such as desiccation, acidification, dilution, chemical preservation and reaction.
- Specific procedures - describe the steps used to analyze the sample.
- Equipment employed - identify the devices used by brand name and model number, indicating accuracy and sensitivity where appropriate.

7. Quality Assurance Procedures

These procedures should contain references to the Quality Assurance (QA) manual and to other written procedures. Written procedures, as performed, will be appended if appropriate. The usual types of pre-test procedures performed and written up are:

- Equipment and supply procurement and check-out;
- Equipment calibration procedures - general and test specific descriptions;
- Field checks of equipment and calibration - some procedures require these types of checks prior to sample collection or analysis, others are suggested, and others may be peculiar to the particular test or test crew. Types of checks include leak checks, temperature measuring device ice-point check, use of calibrated orifices, field check of lab-prepared materials (tare weights, flask volumes).

Most QA activities are directed towards pre- and post- sampling functions rather than sampling activities. QA actions during sample collection are in large part subjective evaluation of the sampling process using pre- and post- test data as guidelines. This section should discuss such items as instrumental baseline drift checks, physical integrity of the sample collection system, and observation of system behavior compared to expected results, e.g., cylinder gas pressure drop and sampling train vacuum.

Post-test activities generally serve as confirmation that the system operated properly during sample collection. Other aspects to be discussed include procedures for determining values for those parameters that can change during sampling, but do not necessarily invalidate the sampling.

Analytical quality assurance usually involves the use of internal and external standards for equipment and operator checks. All types and procedures should be discussed. Specifics may include:

- Field and laboratory blanks
- Sample spikes
- Duplicate and replicate analyses
- Audit sample analysis (simulated field samples)
- Contamination prevention procedures
- Recovery determinations
- Precision and accuracy determinations

Data handling quality assurance procedures are often overlooked both in performance and reporting. Typical categories which should be discussed are:

- Error checking
- Procedures for statistical analysis of data
- Verification of calculation procedures
- Proofreading
- Chain of custody

The quality assurance section of the report should contain a brief statement describing the chain of custody of the samples. The actual chain of custody forms (See Figure 4-17) are included in the appendix.

8. Detailed Results

The detailed results section should contain the pertinent details of the sampling and analysis used to determine the final results. The level of detail will vary with the number, type, and complexity of tests performed. The report should contain at least one example calculation for each and every step in the process. One or more appendixes may be necessary for the summarized highlights.

Typical emission parameters to be presented are:

- Pollutant emission data - specie, mass discharge rate, concentration;
- Exhaust gas parameters - volumetric flow rate, velocity, temperature, composition;
- Sampling variables - times, volumes sampled, isokineticity, sample extraction rates, etc.

Details of all process data collected are identified and may be summarized, but all data must be presented in the report. Calculation of data for compliance evaluations, use of material or fuel analysis results for process rate determinations, and the like are shown. Also include any miscellaneous calculations such as determining flow rates where the gas flow is not determined at the point of discharge (e.g., measuring flow at the inlet of a multi-discharge baghouse, but sampling at the outlet).

FIGURE 4-17. EMISSION TEST REPORT RECOMMENDED FORMAT: FORM FOR CHAIN OF CUSTODY DOCUMENTATION

SAMPLE CHAIN OF CUSTODY

Plant _____

Sampling Date _____ Test number _____

Sample Recovery

Container Code	Description
_____	_____
_____	_____
_____	_____
_____	_____

Person engaged in Sample Recovery

Signature _____
Title _____
Location of Recovery _____
_____
Date and time of Recovery _____

Person receiving sample upon recovery if not recovery person

Signature _____
Title _____
Date and time of receipt _____
Sample storage _____

Laboratory person receiving Sample

Signature _____
Title _____
Date and time of receipt _____
Sample storage _____

Analysis

Container code	Method of analysis	Date and time of analysis	Signature of analyst
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

9. Conclusions

A formal comparison of regulation compliance and emission rates with regulation citations can be included in the conclusions, as well as control device evaluations, recommendations as indicated by the purpose of the test, and judgements regarding the validity and accuracy of the sampling and analytical methods used.

4.4 CONTROL DEVICE MONITORING

The EPA has requirements for NSPS and NESHAP stationary sources to keep records of and report data. These requirements affect such activities as continuous emission monitoring, emission testing, process monitoring, and control equipment operation. This section concerns only those NESHAP and NSPS requirements pertaining to the operation of the air pollution control systems. It should be noted that EPA does not require a standard report format for the various types of data.

4.4.1 Regulatory Requirements

The recordkeeping requirements for NSPS sources are specified in 40 CFR Part 60, Subpart A, §60.7(b), (d). The §60.7(b) and §60.7(d) require the owner or operator to maintain records on the occurrence and duration of any malfunction of the air pollution control equipment for at least 2 years. Unlike the EERs [§60.7(c)], the control device malfunction records need not be submitted regularly.

The specific data requirements for the various industrial categories are presented in Table 4-7. It is apparent that EPA has included control system monitoring requirements for only those sources for which a continuous emission monitor is not used, i.e., wet scrubbers and incinerators.

The explicit data requirements pertaining to the air pollution control equipment are, in most cases, very brief. For example, operators of thermal incinerators need only record the exit gas operating temperature. On the surface it would seem that no recordkeeping format is necessary because of the limited extent of the specified control device operating data. However, the implicit recordkeeping requirements in Subpart A, §60.11 (d) suggest that it would be in the best interest of facilities subject to thes requirements to develop a standard format. Because to satisfy this provision of the NSPS regulations, owners and operators of air pollution control systems must monitor and record some key operating parameters not explicity listed in the various subparts.

> At all times, including periods of startup, shutdown and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.

TABLE 4-7. CONTROL EQUIPMENT MONITORING REQUIREMENTS FOR NSPS SOURCES

Control Technique	Parameter	Subparts Requiring Monitoring
Wet Scrubber	Pressure drop	N, T, U, V, W, X, Y, BB, KK, LL, NN
	Water pressure	N, Y, BB, NN
	Inlet gas temperature	Y
	Liquid flow rate	LL
Incinerator	Thermal incinerator exhaust temperature	BB, EE, MM, RR, SS, TT, WW, FFF
	Catalytic incinerator upstream temperature	EE, MM, RR, SS, TT, WW, FFF
Afterburner	Combustion zone temperature	UU
Electrostatic Precipitator	Inlet gas temperature	UU
High Velocity Air Filter	Inlet gas temperature	UU
Fabric Filter	None	
Solvent Recovery System	Total volume of VOC-solvent recovered	EE, QQ, RR
	Estimated emission percentage	QQ
	VOC concentration of of exhaust	FFF
Emission Control System	Pressure Drop	PP

4.5 PROCESS MONITORING

The preponderance of process monitoring and associated recordkeeping and reporting requirements for NSPS sources relate to process throughput parameters, with certain facilities subject to requirements that are peculiar to their specific industry. For example, primary aluminum reduction facilities are required to monitor and record daily production rates of aluminum and anodes and to record daily cell or potline voltages. Requirements for NESHAP sources are limited to vinyl chloride and are contained in the recordkeeping requirements 40 CFR Part 61.71.

Process monitoring, recordkeeping, and reporting are required in 31 subparts in 40 CFR Part 60 stet and one subpart in 40 CFR Part 61. Subpart Ka, Storage Vessels for Petroleum Liquids Constructed after May 18, 1978, contains requirements that lend themselves to developments of a standard report format.

4.5.1 Regualtory Requirements

Table 4-8 lists NSPS requirements for process monitoring, recordkeeping, and reporting. In order to define properly the requirements, it is necessary to differentiate among requriements fdor monitoring, recordkeeping, and reporting as these requirements are mutually exclusive in many of the subparts.

Although 23 subparts for NSPS sources are listed in Table 4-8, only four subparts are affected by actual reporting requirements. Those are as follows:

Subpart	Affected Facility
Ka	Storage Vessels for Petroleum Liquids Constructed after May 18, 1978
Z	Ferroalloy Production
VV	Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry
GGG	Equipment Leaks of VOC in Petroleum Refineries

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
E	60.53(a)	Incinerators		X		Record daily charge rates and hours of operation.
F	60.63(a)	Portland Cement Plants		X		Record daily production rates and kiln feed rates.
G	60.73(c)	Nitric Acid Plants		X		Record daily production rate and hours of operation.
H	60.83(b),(c)	Sulfuric Acid Plants	X	X		Establish and record a conversion factor at least three times per day.*
J	60.105(c)	Petroleum Refineries		X		Record the average coke burn-off rate and hours of operation daily.
	60.105(d)			X		For certain cat. crackers, record the rate of combustion of solid or liquid fuels and the hours of operation such fuels are combusted in the incinerator-waste heat boiler.
K	60.113(a)	Petroleum Storage Vessels Constructed after June 11, 1979 and before May 19, 1978.		X		Record the petroleum liquid stored, the period of storage, and the maximum true vapor pressure of that liquid during the respective storage period.
						*Alternative allowed.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
Ka	60.113a (a)(1)	Storage Vessels for Petroleum Liquids Constructed after May 18, 1978			X	For primary seals, gap measurements shall be reported after the initial fill with petroleum liquid and at least once every five years thereafter. For secondary seals, gap measurements shall be reported after the initial fill with petroleum liquid and at least once every year thereafter.
	60.115a(a)			X		Record the petroleum liquid stored, the period of storage, and the maximum true vapor pressure of that liquid during the respective storage period.
N	60.143(a)	Iron and Steel Plants	X	X		Monitor and record time and duration of each steel production cycle, and time and duration of any diversion of exhaust gases from main stack serving BOPF.
O	60.153(a)	Sewage Treatment Plants	X X			Monitor mass or volume of sludge charged. Weighing device must be installed to determine mass of municipal waste charged.
P	60.165(a)	Primary Copper Smelters		X		Monthly record of total smelter charge and weight percent (dry basis) of arsenic, antimony, lead and zinc.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
S	60.194(a)	Primary Aluminum Reduction	X			Monitor daily production rates of aluminum and anodes.
	60.194(b)			X		Record daily production rates of aluminum and anodes, raw material feed rates, and cell or potline voltages.
T	60.203(a)	Wet-Process Phosphoric Acid Plants	X			Monitor mass flow of phosphorous-bearing feed material.
	60.203(b)			X		Daily record of equivalent P_2O_5 feed.
U	60.213(a)	Superphosphoric Acid Plants	X			Monitor mass flow of phosphorous-bearing feed material.
	60.213(b)			X		Daily record of equivalent P_2O_5 feed.
V	60.223(a)	Diammonium Phosphate Plants	X			Monitor mass flow of phosphorous-bearing feed material.
	60.223(b)			X		Daily record of equivalent P_2O_5 feed.
W	60.233(a)	Triple Superphosphate Plants	X			Monitor mass flow of phosphorous-bearing feed material.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
	60.233(b)			X		Daily reccord of equivalent P_2O_5 feed.
X	60.243(a)	Granular Triple Superphosphate Storage Facilities		X		Maintain accurate account of triple supershosphate in storage.
	60.243(b)			X		Maintain daily record of total equivalent P_2O_5 stored.
Y	60.253	Coal Preparation Plants	X			Monitor temperature at exit of thermal dryer.
Z	60.264(c)	Ferroalloy Production Facilities			X	Report any product changes.
	60.265(a)			X		Maintain daily records of: (1) Product being produced. (2) Description of constituents of furnace charge, including the quantity by weight. (3) Time and duration of each tapping period and the identification of material tapped (slag or product.) (4) All furnace power input data obtained under paragraph (b) of this section. (5) All flow rate data obtained under paragraph (c) of this section or all fan motor power consumption and pressure drop data obtained under paragraph (e) of this section.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
AA	60.274(a)	Electric Arc Furnaces		X		Maintain records daily of: (1) Time and duration of each charge; (2) Time and duration of each tap; (3) All flow rate data obtained under (b) or equivalent under(d) (4) All pressure data obtained under (e).
	60.274(b)		X			Continuously record the volumetric flow rate through each separately ducted hood.
	60.274(e)		X			For direct shell evacation systems, continuously record the pressure in the free space inside the EAF.
AAa	60.274(a)	Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels constructed after August 7, 1983		X		Maintain records of: (1) All static pressures and control system fan motor amperes and damper positions or volumetric flow rates of ducted hoods obtained under paragraph (b) of this section; (2) All monthly operational status inspections performed under paragraph (c) of of this section.
	60.274(f)			X		Monitor pressure in EAF free space when DEC system is in use.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
GG	60.334(a)	Stationary Gas Turbines	X	X		Monitor and record fuel consumptionand water/fuel ratio if using water injection.
	60.334(b)		X			Monitor the sulfur and nitrogen content of fuel.
HH	60.343(d)	Lime Manufacturing Plants	X			Monitor the mass rate of limestone feed for the purpose of conducting a performance test under §60.8.
NN	60.403	Phosphate Rock Plants	X			Monitor the phosphate rock feed to any affected dryer, calciner, or grinder for the purpose of conducting a performance test under §60.8.
PP	60.423	Ammonium Sulfate Manufacture	X			Monitor the mass flow of ammonium sulfate feed material to the process.
QQ	60.434(a)	Graphic Arts Industry: Publication Rotogravure Printing		X		Record amount of water and solvent used.
RR	60.445(a)	Pressure-Sensitive Tape and Label Surface Coating		X		Record of all coatings used and results of testing required under § 60.446(a).
TT	60.464(a)	Metal Coil Surface Coating		X		Average VOC content of coatings.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facility	Monitoring	Recordkeeping	Reporting	Comments
UU	60.473(c)	Asphalt Processing and Asphalt Roofing Manufacture	X			Administrator will determine process parameters to be monitored.
VV	60.482-2 60.486 60.487	Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry	X	X	X	Monitor pumps in light service for leaks.
	60.482-4 60.486		X	X		After each pressure release, monitor pressure relief device in gas/vapor service for detectable emissions.
VV	60.482-7 60.486 60.487		X	X	X	Monitor valves in gas/vapor service for leaks.
	60.482-8 60.486 60.487		X	X	X	If evidence of a potential leak is found, monitor instrumentally for leaks within 5 days: pumps and valves in heavy liquid service, pressure relief devices in light or heavy liquid serivce, and flanges and other connectors.

TABLE 4-8. PROCESS MONITORING
RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)
40 CFR Part 60
(NSPS Sources)

Sub Part	Section	Affected Facitlity	Monitoring	Recordkeeping	Reporting	Comments
XX	60.502(j)	Bulk Gasoline Terminals		X		Record of leaks detected in vapor collection system, vapor processing system, and loading rack.
	60.505			X		Record of tank truck vapor tight-documentation and replacements or additions of components on vapor processing systems.
GGG	60.592	Equipment leaks of VOC in Petroleum Refineries		see Subpart VV		

Under Subpart Ka, Section 60.113a(a) requires that measurement of the gap areas and maximum gap widths between the primary seal and the tank wall be performed within 60 days of the initial fill with petroleum liquid and once every five years thereafter. For secondary seals, gap measurements must be performed within 60 days of the initial fill with petroleum liquid and at least once every year thereafter. A procedure for performing these measurements is identified in 40 CFR Part 60.113a(a).

A written report of the results must be submitted within 60 days of performance of the gap measurements. Figure 4-18 presents a suggested report format. It should be noted that 40 CFR Part 60.115a(a) requires maintenance of the data for product stored, true vapor pressure, product storage temperature, and period of storage, but does not require these data to be submitted. Therefore, the submitting this information with the gap measurement data is optional.

Subpart Z for Ferroalloy Production Facilities, 40 CFR Part 60.264(c), requires a written report be submitted that describes any product changes.

Subparts VV (and GGG by reference) require that semiannual reports be submitted beginning six months after the initial start up date. The initial semiannual report must include: (1) identification of affected process units, (2) the number of valves subject to Section 60.482-7, (3) the number of pumps subject to Section 60.482.2, and (4) the number of compressors subject to Section 60.482-3. All the semiannual reports must include: (1) process unit identification, (2) dates of process unit shutdowns which occurred within the semiannual reporting period, (3) revisions to items reported in initial report, and, for each month during the semiannual reporting period, (4) the number of valves for which leaks were detected, (5) the number of valves for which leaks were not reported as repaired, (6) the number of pumps for which leaks were detected, (7) the number of pumps for which leaks were not repaired as required, (8) the number of compressors for which leaks were detected, (9) the number of compressors for which leaks were not repaired, and (10) the facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible.

The only NESHAP source process monitoring, and associated recordkeeping or reporting requirement in 40 CFR Part 61 is in Section 61.71(u)(4) for vinyl chloride. Daily operating records, including pressures and temperatures must be maintained for each polyvinyl chloride reactor. Such records must be retained and made available for inspection by the Administrator or his representative for a minimum of two years.

FIGURE 4-18. FORMAT FOR REPORTING SEAL GAP MEASUREMENTS FOR FLOATING ROOF TANKS
40 CFR Part 60.113a
(NSPS Sources)

Firm Name_____Telephone_____

Address of Premises_____

_____

Responsible Person to Contact_____

Date_____19____

Tank No.	Gap Area (sq.in)		Max. Gap width (in)		Date of Measurement	Product Stored	True Vapor Pressure (psi)	Prod. Stg. Temp. (°F)	Period of Storage
	Primary Seal	Secondary Seal	Primary Seal	Secondary Seal					

4.6 SPECIAL NESHAP REQUIREMENTS

Many EPA regulations for NESHAP sources (contained in 40 CFR Part 61) have requirements for reports and the recording of data that do not logically belong in any of the preceding sections of this document. These include notifications that detail pertinent data on the particular projects and the results of certain leak monitoring and ambient sampling programs.

4.6.1 Regulatory Requirements

The NESHAPs contained in the subparts to 40 CFR Part 61 are as follows:

1. Subpart C - Beryllium
2. Subpart D - Beryllium Rocket Motor Firing
3. Subpart E - Mercury
4. Subpart F - Vinyl Chloride
5. Subpart J - Equipment Leaks (Fugitive Emission Sources) of Benzene
6. Subpart M - Asbestos
7. Subpart V - Equipment Leaks (Fugitive Emission Sources)

The beryllium reporting requirements are for both extraction and end product uses. A source test report is required if compliance is based on an emission standard; otherwise, an ambient concentration of 0.01 g/m^3 of beryllium averaged over 30 days must not be exceeded. The results of the ambient monitoring system must be reported every 30 days.

The standard for rocket motor test sites is an ambient beryllium concentration. Release of beryllium resulting from the collection of combustion products in a closed tank is regulated by a limit on emissions measured by continuous sampling conducted during the release. Reports presenting the data collected during either ambient or source sampling is due 30 days after sample collection or prior to any further motor firings or propellant disposal.

The standards for mercury apply to ore processing facilities, chlor-alkali manufacturing plants, sludge dryers, and sludge incinerators. Source tests are required for all of these facilities. Sludge dryers and incinerators may use a sludge test in lieu of a source test. All results must be reported within 30 days of sample collection.

Vinyl chloride standards affect various process equipment and other plant components (e.g., valves, seals, pumps) that have the potential for fugitive emissions. The regulations require the submittal of reports for the source tests and continuous monitoring programs. Additionally, reports that provide notification and certain information on any emergency manual vent valve or emergency relief valve discharge are required. Submittal of these reports is required within 10 days of a discharge.

The asbestos regulations affect all aspects of asbestos uses -- production from a raw material, a finished product, to disposal of waste asbestos. The specific activities affected are asbestos mills, roadway surfacing, manufacture of asbestos containing products, demolition and renovation of asbestos-containing structures, asbestos spraying, fabricating with asbestos, use of insulating materials, waste disposal, and waste disposal sites.

The requirements for asbestos contained in this section include an initial report (format in Appendix A of 40 CFR 61), notification of project dates, and the reporting of certain project information for the demolition and renovation of structures and the spraying of asbestos. The regulations exempt certain demolition and renovation projects from the detailed project reports if the amount of pipe covered or coated with friable asbestos is less than 80 meters and if the amount used elsewhere is less than 15 square meters.

The regulations concerning equipment leaks (Subparts J and V), like the vinyl chloride standards, affect various process equipment and components (e.g., valves pumps, compressors) that have the potential for fugitive emissions. The regulations require detailed recordkeeping on the status (leak detection, repair, etc.) of the subject equipment and submittal of an initial report identifying this equipment and semiannual reports thereafter summarizing its status.

Table 4-9 summarizes the NESHAP regulations for emission standards, sampling, monitoring, and reporting. Portions of this table were extracted from Reference 1.

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart C - BERYLLIUM Proposed 12/7/71 (3 FR 23239) Promulgated 4/6/73 (38 FR 8826) Revised 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)	Extraction plants Ceramic plants Foundries Incinerators Propellant plants Machine shops (which process alloy containing >5% beryllium)	1) 10 g/24 h 2) Ambient concentration in the vicinity of the stationary source of 0.01 g/m^3, averaged over 30-day period	1) Source test 2) 3 years continuous monitoring data	1) Source test report 2) Beryllium concentrations every 30 days
Subpart D - BERYLLIUM Rocket Motor Firing Proposed 12/7/71 (36 FR 23239) Promulgated 4/6/73 (38 FR 8826) Revised 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800)	Rocket motor test sites Closed tank collection of combustion products	75 µg/min scm of air within 10 to 60 min, accumulated during 2 consecutive weeks, in area which could adversely affect public health 2 g/h, 10 g/day	Ambient concentrations measured during and after firing or propellant disposal Continuous sampling during release	Ambient and source sampling Results within 30 days of collection or before subsequent firings or propellant disposal

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (Continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart E - MERCURY	Ore processing	2300 g/24 h	Source test	Source test and sludge sampling Results within 30 days of sample collection
Proposed 12/7/71 (36 FR 23239)	Chlor-alkali manufacture	2300 g/24 h	Source test	
Promulgated 4/6/73 (38 FR 8826)	Sludge dryers or incinerators	3200 g/24 h	Source test or sludge test (Sources exceeding 1600 g/day must monitor once per year)	
Revised 10/14/75 (40 FR 48299) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800) 6/8/82 (47 FR 24703) 9/12/84 (49 FR 35768)				
Subpart F - VINYL CHLORIDE				Source test reports as required. Initial report addressing requirements of polyvinyl chloride: Notification and information on emergency manual vent valve discharge within 10 days of discharge
Proposed 12/24/75 (40 FR 59532)	Ethylene dichloride manufacture	1) Ethylene dichloride purification: 10 ppm* 2) Oxychlorination reactor: 0.2 g/kg (0.0002 lb/lb) of the 100% ethylene dichloride product	Source test Continuous monitor Source test Continuous monitor	
Promulgated 10/21/76 (41 FR 46560)	Vinyl chloride manufacture	10 ppm*	Source test Continuous monitor	
Revised 12/3/76 (41 FR 53017) 6/7/77 (42 FR 29005) 8/17/77 (42 FR 41424) 3/3/78 (43 FR 8800) 9/8/82 (47 FR 39485)	Polyvinyl chloride manufacture Reactor; stripper; weighing and holding containers; monomer recovery system	10 ppm*	Source test Continuous monitor	

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (Continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart F (cont'd.)	Polyvinyl Chloride Manufacture (cont'd)		Source test	Ethylene dichloride, vinyl chloride, and/or polyvinyl chloride: Notification and information emergency relief valve discharge within 10 days of discharge
	Reactor opening loss	0.02 g vinyl chloride/kg (0.00002 lb vinyl chloride/lb)	Continuous monitor	
	Reactor manual vent	No emissions		
	Sources following stripper	For each calendar day:		
		1) Using stripping technology - 2000 ppm for polyvinyl chloride dispersion resins (excluding latex) 400 ppm each for other polyvinyl chloride resins (including latex)	Source test	
		2) Other than stripping technology - 2 g/kg (0.002 lb/lb) product for dispersion polyvinyl chloride resins (excluding latex)	Source test	
	Ethylene dichloride, vinyl chloride and/or polyvinyl chloride manufacture			
	Relief valve discharge	No discharge	Equipment	
	Loading and unloading lines	0.0038 m^3 after each loading or unloading, or 10 ppm when contained by a control system	Source test Continuous monitor	

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (Continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart F (cont'd.)	Slip guages	10 ppm from the required control system	Source test Continuous monitor	
	Pump; compresser and agitator seal	10 ppm from the required control system with seals	Source test Continuous monitor	
	Leakage from relief valves	Rupture disk must be installed	Equipment	
	Manual venting of gases	10 ppm from a required control system	Source test Continuous monitor	
	Opening of equipment	10 ppm from a required control system*	Source test Continuous monitor	
	Samples (at least 10% by weight vinyl chloride)	Returned to system		
	Leak detection and elimination	Implementation of an approved program	Approved testing program	
	In-process wastewater	10 ppm before discharge	Source test Continuous monitor	
		* Before opening any equipment for any reason, the quantity of vinyl chloride is to be reduced so that the equipment contains no more than 2.0 percent by volume vinyl chloride or 0.0950 m^3 (25 gal) of vinly chloride, whichever is larger, at standard temperature and pressure.		

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (Continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart J - EQUIPMENT LEAKS (FUGITIVE EMISSIONS SOURCES) OF BENZENE Proposed 1/5/81 (46 FR 1165) Promulgated 6/6/84 (49 FR 23498) Revised 10/2/84 (49 FR 38946) 10/31/84 (49 FR 43647)	Pumps, compressors, pressure relief, devices, sampling connection systems, open-ended valves or lines, valves, flanges and other connectors, product accumulator vessels, and control devices or systems designed to produce or use >1,000 Mg/yr benzene	See Subpart V	See Subpart V	See Subpart V

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart M - ASBESTOS	Asbestos mills	No visible emissions, or meet equipment specifications	No requirement	For all sources: An initial report (See Appendix A) with description of emission control equipment
Proposed 7/13/83 (48 FR 32126)	Roadway surfacing	Contain no asbestos except for temporary use on area of asbestos ore deposits	No requirement	
Promulgated 4/5/84 (49 FR 13658)	Manufacturing of products containing asbestos (textiles; cement; fire-proofing and insulating materials; friction products; paper; millboard; felt; floor tiles; paints, coatings, caulks, adhesives, sealants; plastic and rubber materials; chlorine; shotgun shells; asphaltic concrete)	No visible emissions, or meet equipment specifications	No requirement	Exempt sources: Notification and project information 20 days prior to demolition or renovation
Revised 6/21/84 (49 FR 25453)	Demolition and renovation >80 m pipe, covered or coated >15 m^2 duct, boiler, tank, reactor, turbine, furnace, or structural member, covered or coated	No emissions to outside air; Friable materials removed, wetted, or particles mechanically collected	No requirement	Nonexempt sources: Notification and detailed project information 10 before emergency demolition/renovation

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (Continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart M (cont'd.)	Spraying friable asbestos 1) Materials applied to equipment or machinery with >1% asbestos on dry weight basis	No visible emissions, or meet equipment specifications		Asbestos material spraying: Notification and project information 20 days prior to spraying
	2) Materials sprayed on buildings, structures, pipes, conduits	Materials must contain <1% asbestos on dry weight basis	No requirement	
	Fabricating (cement building products; friction products; cement or silicate board for ventilation hoods; ovens; electrical panels; lab furniture; marine construction; flow controls for molten metal industry)	No visible emissions, or meet equipment specifications	No requirement	
	Friable insulating materials	Contain no asbestos	No requirement	
	Waste disposal	No visible emissions Deposit at acceptable disposal sites	Determine air temperature while wetting operations are suspended and record	Initial report (see Appendix A): waste generating processes, waste disposed of per day, emission control systems for water disposal, identification of site
	Waste disposal sites	Design and work practice requirements No visible emissions	No requirement	Initial report (see Appendix A): description of disposal site and compliance methods

TABLE 4-9. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (continued)
40 CFR Part 61

Pollutant	Affected facilities	Emission standard	Sampling or monitoring requirement	Reporting requirements
Subpart V - EQUIPMENT LEAKS (FUGITIVE EMISSION SOURCES)	Pumps	No leakage (instrument reading <10,000 ppm)*	Monthly leak detection and repair	Initial notification of implementation and identification and specifications of subject equipment Semiannual reports: results of leak detection and repair, shutdown dates, revisions to initial report
	Compressors	Meet equipment specifications*	No requirement	
Proposed 1/5/81 (46 FR 1165)	Pressure relief devices	No detectable emissions	No requirement	
	Sampling connection systems	No VHAP emissions Meet equipment specifications	No requirement	
Promulgated 6/6/84 (49 FR 23498)	Open-ended valves or lines	Meet equipment specifications	No requirement	
	Valves	No leakage (instrument reading <10,000 ppm)*	Monthly leak detection and repair program	
Revised 10/2/84 (49 FR 38946) 10/31/84 (49 FR 43647)	Pressure relief devices in flanges and other connectors	No leakage (instrument reading <10,000 ppm)	No requirement	
	Product accumulator vessels	Meet equipment specifications	No requirement	
	Closed vent systems	No detectable emissions	No requirement	
	Control systems: Vapor recovery systems Enclosed combustion devices Flares	 Operate at 95% efficiency Operate at 95% efficiency No visible emissions	 No requirement No requirement Monitor pilot flame	

*May be designated for no detectable emissions

4.7 REFERENCES

1. "National Emission Standards for Hazardous Air Pollutants - A Compilation as of August 1, 1982", EPA-340/1-82-006, August 1982.

2. "Standards of Performance for New Stationary Sources - A Compilation as of December 31, 1984," EPA-340/1-85-005a, March 1985.

5.0 INSPECTION SAFETY

The performance of field inspection duties always involves a certain degree of risk. It is the objective of this chapter to describe means of minimizing this risk through adherence to safety procedures and to established U.S. Environmental Protection Agency policy. Specific procedures are presented for most common health and safety problems encountered during the evaluation of air pollution sources and control devices.

5.1 POTENTIAL HEALTH AND SAFETY HAZARDS

The preferred method of minimizing potential health and safety hazards is through the application of engineering controls which eliminate the problem. This is not usually possible in the case of field activities. Accordingly, the inspector must be constantly aware of potential problems and avoid these to the extent possible. When the environmental conditions demand personal protection equipment, the inspector must know how to select and use this equipment. The limitations of this personal protection equipment must also be appreciated.

5.1.1 Inspection Health and Safety Hazards

The inspection of air pollution control systems inherently involves a large number of potential health and safety problems. A partial list of these potential hazards is provided in Table 5-1. It should be noted that they occur frequently. Therefore, the EPA inspector must be constantly alert so that they can be avoided.

Inhalation hazards are often created by fugitive leaks of pollutant laden gases out of worn expansion joints, cracked welds, and corroded shells of the control system itself. The sudden downdraft from nearby stacks and vents can also lead to acute exposures. The partially confined areas formed by weather enclosures, walkways between compartments, fan houses, and areas adjacent to large ducts allow high concentrations of toxic material to accumulate even when the fugitive emission rates are comparatively small. Most of the high pollutant concentrations occur by accident and without the knowledge of plant personnel. The highly variable conditions make any monitoring data highly questionable even in the rare instance when exposure monitoring has been conducted. These problems complicate the selection of the proper respirator for these conditions.

The risk due to the sudden release of chlorine, ammonia, and high temperature steam is compounded by the location of most air pollution control equipment at elevated portions of the plant. Rapid egress from high platforms is difficult in the large majority of cases.

The elevated and isolated locations of many control systems also increases the inspection safety risk. It is usually necessary to climb permanent or portable ladders to reach the equipment. In some cases, the equipment can only be reached by crossing roofs or elevated walkways. Since these portions of the plant are not regular work areas, even the plant personnel may not be aware of

TABLE 5-1. POTENTIAL HEALTH AND SAFETY RISKS WHILE INSPECTING AIR POLLUTION CONTROL EQUIPMENT

Acute exposure to toxic gases such as aromatic hydrocarbons, chlorinated hydrocarbons, nitrogen oxides, and sulfur dioxide.
Exposure to chemical asphyxiants such as hydrogen sulfide and carbon monoxide.
Exposure to toxic fumes and dusts containing asbestos, lead, beryllium, and arsenic.
Falls through roofs or through horizontal surfaces weakened by the accumulation of excessive solids or the corrosion of supports.
Falls on wet and/or icy walking surfaces.
Falls from ladders with mud or ice on the foot rungs.
Falls from improperly maintained or secured portable ladders.
Head injuries from falling objects, overhead beams, and protruding obstacles.
Static electrical shock during measurements conducted downstream of electrostatic precipitators or in any fiberglass ducts.
Duct explosions initiated by static accumulation on measurement probes.
Entrapment in rotating mechanical equipment such as fan sheaves and screw conveyors.
Explosions of fans operating at excessive tip speeds and/or operating severely out-of-balance.
Asphyxiation due to free flowing solids discharged from hopper access hatches.
Injuries due to fast moving plant equipment such as fork lifts and overhead cranes.
Burns due to contact with hot objects such as uninsulated flue gas ducts and stacks.
Burns due to acid spray from leaking process equipment.
Burns due to high pressure steam leaks.
Eye injuries due to splashing chemicals and flying objects.
Hearing impairment due to exposure to high noise levels.
Burns due to contact with highly alkaline dusts and liquids.
Static electrically initiated explosions while obtaining samples of fuel oils, waste oils, or coatings.
Electrical shock due to exposed high voltage lines.
Electrical shock due to contact with exposed parts within an electrical cabinet.
Insect stings due to approaching nests which are often located in the warm and sheltered areas around hoppers, weather enclosures, and electrical cabinets of air pollution control systems.
Inhalation of bacteria, viruses, and fungi from material being handled prior to or by the control system.
Exposure to toxic clouds of chlorine or ammonia released during plant upsets.
Heat stress due to hot process equipment, hot gas ducts, and stacks.
Cold stress due to work at elevated portions of a plants or in areas unprotected from the wind.
Lightning injuries due to work at elevated portions of the plant.
Absorption of chemicals through the skin.
Asphyxiation in oxygen deficient atmospheres.

some of the potential problems involved with the ladders and roof areas. Some areas do not have guard rails and some have only improperly secured guard rails. Roofs which cannot take the weight of one or more individuals are relatively common. Furthermore, there are frequently cables, hoses and debris along the elevated platforms and roofs since plant maintenance personnel find it difficult to remove this material. Injuries which occur in these portions of the plant can be very serious. Rescue of injuried personnel is difficult and time consuming due again to the isolated and elevated locations of control equipment.

There are several factors which make an agency inspector more at risk to the potential hazards than plant personnel. The inspector is rarely familiar with the numerous walking hazards such as missing grate sections, protuding beams and valves, weakly supported ladders and guard rails, and exposed electrical lines. Plant personnel may take such conditions for granted and forget to point them out to visiting inspectors. Also, the inspector can easily become so preoccupied with conversations with the plant personnel that supposedly obvious hazards are not recognized. On occassion plant personnel attempt to hurry the inspector so that they can get back to more pressing production-related duties. This inadvertedly increases the the risk of injury.

The inspector who often does his work in a different place each day does not have the opportunity to physically acclimate to the heat stress caused by some systems. Also, the inspector may be sensitive to certain materials used in or certain pollutants generated by the process.

Due to the numerous potential hazards, is very important that each inspector adhere to established safety policies and procedures. It is also necessary that the inspector recognize unusual and extreme conditions, in which additional or extreme safety precautions are warranted.

5.1.2 General Precautions

To minimize the risk of potential hazards, each inspector should follow the general rules summarized below.

- The work should be halted immediately when the inspector suffers one or more of the nonspecific symptoms of exposure. The area of possible exposure should be approached again only after the proper personal protective equipment has been obtained.
- The work should be conducted at a controlled pace.
- If the work cannot be accomplished safely, it should be postponed until the appropriate engineering controls and/or plant operational procedures are changed to permit safe inspection.

- o Nothing should be done which risks the health and safety, of the inspector. Nothing should be done which risks the health and safety of plant personnel or which risks the condition of plant equipment.

- o All agency and plant safety requirements must be satisfied at all times.

Work should be interrupted whenever an inspector encounters any non-specific symptoms of exposure such as headache, anusea, drowsiness, chest pains, shortness of breath, lightheadedness and/or eye irritation. While these feelings may not be due to any exposure which occured at the plant, the inspctor cannot afford to base his actions on this assumption. These are the initial symptoms of exposure to a variety of pollutants. If the inspector (and/or plant personnel) has been exposed they can be disabled in a very short time. When these symptoms are experienced the inspector should immediately go to a well-ventilated area.

It is important that the inspector work at a controlled pace to minimize the chances of accidents while walking and climbing at the plant and while making measurements. Inspectors must never shortcut safety procedures.

Occassionally, it is necessary to terminate an inspection due to serious safety risks. The most common reasons include inclement weather, severely vibrating fans, apparently weak walkways or roofs leading to the collector, high concentrations of fugitive pollutants, and intermittant releases from process equipment. If there is a significant health and safety risk for any reason, the inspection should be terminated. The inspector should notify his or her supervisor of the problem, and alternative inspection procedures should be established by follow-by negotiations with the plant management. The inspection should then be completed immediately after the necessary changes are made in the plant conditions and/or the inspection procedures.

Often there are equipment related factors which limit the effectiveness of the inspection. For example, many control systems do not have any test ports to facilitate the measurement of static pressures, temperatures, and oxygen concentrations. An inspector must never demand that such ports be installed while the equipment is operating since it is possible to cause an explosion within the ducts of numerous types of sources. Often when ports are available, they are at dangerous locations. The inspector should not attempt to use such ports and should not ask plant personnel to make these measurements.

It is the responsibility of each inspector to know all of the applicable safety requirements for each plant inspected and to know all of the agency safety requirements. The most stringent of these must be followed. Even when plant personnel are not using common safety equipment such as hard hats and safety shoes, the inspector must always use this equipment. The inspector cannot afford to abdicate judgement on safety procedures to plant personnel.

5.2 U. S. ENVIRONMENTAL PROTECTION AGENCY HEALTH AND SAFETY POLICY

Health and safety policy for EPA field personnel is set forth in EPA Order 1440.2 dated July 12, 1981. Supervisory personnel are responsible for ensuring that all employees have access to this order and have the necessary training and personal protective equipment as required by the order. All inspectors have a responsibility to use the personal protective equipment and to fully adhere to the policies and procedures established.

5.2.1 Training

An important aspect of Administrative Order 1440.2 is the requirement for safety training directed at the specific types of field activities performed by EPA personnel. There is a basic course for all field personnel, an intermediate course for individuals involved in hazardous waste site work and other potentially dangerous activities, and an advanced course for individuals who manage investigations at hazardous waste sites.

The basic course consists of 24 hours of in-class training. It should be completed prior to involvement in the routine field activities. The subjects addressed include, but are not limited to, the subjects listed in Table 5-2.

Table 5-2. SUBJECTS ADDRESSED IN BASIC SAFETY COURSE

Employee Rights and Responsibilities
Nature of Anticipated Hazards
Emergency Help and Self-Rescue
Vehicles - Mandatory Rules and Regulations
Safe Use of Field Equipment
Use, Handling, Storage, and Transportation of Hazardous Materials
Personal Protective Equipment and Clothing, Use and Care
Safe Sampling Techniques

At the conclusion of this course, the inspector should appreciate the importance of proper safety procedures, understand how to recognize and avoid common health and safety hazards, understand how to select and use personal protective equipment, and know how to use portable inspection equipment. In addition to this classroom instruction, it is important that each trainee accompany an experienced inspector for a minimum of three days of field work within 3 months of the classroom sessions. Following this work, the individual will be awarded a certification upon completion of the Basic Level Instruction from the Occupational Health and Safety Designee at the Reporting Unit. Without this certification, no EPA employee should be involved in any field activities.

Intermediate Level training is necessary for any inexperienced personnel who will be working with experienced employees at uncontrolled hazardous waste and hazardous spill site investigations. Such training is also required for

individuals involved in other activities which have been ascertained to include unique hazards. This course consists of a minimum of 8 hours in addition to the 24 hour basic course and emphasizes topics relevant to health and safety problems potentially involved in this type of field work. In the case of hazardous waste site work these topics would include those listed in Table 5-3.

TABLE 5-3. INTERMEDIATE LEVEL SAFETY TRAINING

Site surveillance, Observation, and Safety Plan Development
Use and Decontamination of Totally Enclosed Protective Clothing and Equipment
Use of Field Test Equipment for Radioactivity, Explosivity, and Other Measurements
Topics Specific to Other Identified Activities

There are a number of situations which warrant Intermediate Level training for field personnel who are inspecting air pollution control systems. A partial list includes: inspection of sources of toxic materials, inspection of sources of hazardous materials (designated under Section 112 of the Clean Air Act), inspection of sources of hydrogen sulfide, inspection of coke oven batteries, and inspection of sources of highly explosive dusts such as coal dust, flour, grain, and metallic fumes. In such cases, the training should emphasize the potential hazards in lieu of items 1 through 3 in Table 5-3.

As with the Basic Level Course, each inspector must complete three days of field demonstration work under the supervision of an experienced agency inspector. The individual taking the course must demonstrate the ability to train others to perform routine inspection activities. Employees completing these requirements will be issued a certificate by the Occupational Health and Safety Designee.

The Advanced Level training is necessary for any EPA employee who will be managing uncontrolled hazardous waste site and spill site monitoring, sampling, investigations, and cleanup operations. It involves (in addition to the 24 hour basic course) 8 hours of classroom instruction concerning the topics exclusively involving hazardous waste site field activities. This training is not necessary for field personnel who work only with air pollution control systems.

All EPA employees are required to complete at least 8 hours of refresher training annually to maintain safety certification. This training must be oriented toward the specific Training Level desired and include topics relevant to the type of work performed by the individual. Also, inspectors must

demonstrate that they have sufficient practical field experience to ensure that work can be conducted in a safe and healthful manner. A record of the current level of certification must be maintained in the employee's file.

5.2.2 Occupational Medical Monitoring Requirements

All field personnel involved in the inspection of air pollution control systems must be included in an Occupational Medical Monitoring Program regardless of the level of inspections conducted by the individual. A complete description of the U.S. Environmental Protection Agency Medical Monitoring Program Guidelines should be available to each person assigned to field activities.

There should be a baseline medical examination performed on each person who will be assigned field duties. This provides a frame of reference for later medical examinations and can therefore be of use in identifying changes due to occupational exposure. There should also be a periodic reexamination. This is performed at a frequency dependent on the type of work done by the individual. For most inspectors involved with air pollution control sources, it should be performed biennually. There should also be an examination whenever an individual is terminating any field work due either to reassignment to other agency duties or due to leaving government service.

The scope of each type of medical examination is shown in Table 5-4 which is based on the Attachment 1 of the EPA Medical Monitoring Guidelines. Specific blood tests and urinalysis tests are described in the Medical Monitoring Guideline. Inspectors should also consult the Medical Monitoring Guidelines (and any recent revisions) to determine what types of immunizations are recommended.

5.2.3 Written Safety Procedures

It is the policy of the Environmental Protection Agency to administer its programs in a manner that will assure its employees places and conditions of employment free from recognized hazards which are likely to cause death or serious harm. Accordingly, the U.S. EPA has issued certain policy statements and guidelines concerning health and safety. It is the responsibility of both supervisors and employees to carefully review updated copies of these policy statements and guidelines. All requirements stated in these documents must be followed.

The safety material presented in this manual is simply a condensed summary of U.S. EPA policy statements and guidelines concerning inspection safety. It is not intended to substitute for the above documents.

The EPA Policy and Responsibilites are set forth in an Administrative Directive dated May 14, 1982. As stated in Section 5, Paragraph b of this directive, the provisions do apply to EPA personnel conducting field work at private facilities. Some of the most important requirements of this directive concerning the inspection of air pollution control systems are described in the paragraphs which follow.

TABLE 5-4. MEDICAL MONITORING EXAMINATIONS*

	Baseline	Periodic	Termination
History and Physical Examination			
Complete Medical History	x		x
Interval History		x	
Physical Exam by Physician	x	x	x
Visual Acuity	x	x	x
Routine Laboratory Tests and Procedures			
Pulmonary Function	x	x	x
Audiometry	x	x	x
Electrocardiogram	x	o	x
Chest X-ray	x	x	x
Complete Blood Count	x	x	x
Blood Chemistry	x	x	x
Special Tests			
Cholinesterase	o	x	o
Methemoglobin	o	x	o
Heavy Metal Screen	o	x	o
Urine and Sputum Cytology	o	o	o
Toxicological Studies	o	o	o

Notation: x Recommended
o As Indicated

*See Attachment 1, Table 1 of Medical Monitoring Guideline concerning recommendations for unscheduled medical examinations and concerning research oriented tests and procedures.

"EPA employees may be withdrawn from private sector facilities if safe and healthful working conditions conditions cannot be assured by the use of administrative controls and personal protective equipment."

"Supervisors are responsible, to the extent of their authority, for the health and safety of their employees and for furnishing them employment and a place of employment which are free of recognized hazards that are likely to cause death or serious harm. They shall

comply with the Agency's occupational health and safety standards and with all rules, regulations, and orders issued by the Agency with respect to the occupational health and safety programs and shall enforce correct work practices."

"Employees shall comply with the Agency's occupational health and safety standards, rules, regulations, and orders which are applicable to their own actions and conduct. Employees shall also use the safety equipment, personal protective equipment, and other health and safety devices and shall follow the procedures, provided or as directed, that the Agency deems necessary for their protection."

The first of these excerpts provides the policy basis for general rule number 3 (see Section 5.1.2) discussed earlier. Simply stated, the inspection should be terminated whenever it is apparent that the field activities involve a significant health and/or safety risk. Administrative procedures on the part of the source and the use of personal protective equipment may be required before the inspection can be performed.

This directive clearly requires that supervisors take an active role in the health and safety program. They must ensure that each field unit has copies of the latest health and safety policy guidelines, rules, regulations, and written procedures. Also, supervisory personnel should review each employee's record to confirm that each has had the certified training necessary for the types of assigned duties and that each has had the specified medical monitoring examination. The supervisor is responsible for continually stressing the importance of proper safety procedures. In the event that an employee has to interrupt an inspection due to a suspected safety or health related issue, the supervisor should work with the inspector and the source personnel to design alternative inspection approaches free of these recognized hazards. It is often necessary for the supervisory personnel to contact agency specialists and management personnel to develop the alternative procedures.

The individual inspector must bear a significant portion of the overall responsibility in ensuring safe field practices. The inspector should follow all agency and source safety procedures even when others at a facility are ignoring these requirements. Furthermore, the inspector must be constantly alert for unusual conditions which have not been directly addressed by applicable safety procedures. If there is any question concerning the appropriateness or completeness of the safety precedures, the inspection should be terminated immediately. Further guidance should be obtained from supervisory personnel before resuming the field work. The inspector mst exercise common sense at all times while conducting field activities.

The inspector should report all occupational accidents and illnesses, regardless of the assumed level of severity. All incidents which could have resulted in accidents or pollutant exposure should be reported to supervisory personnel so that the Agency procedures can be refined as necessary to minimize future health and safety problems. Furthermore, any conditions at a specific plant which could cause injuries to Agency field personnel should be reported so that other EPA personnel who visit the facility can be advised of the potential conditions.

5.3 SPECIFIC SAFETY AND HEALTH PROCEDURES FOR INSPECTION OF AIR POLLUTION CONTROL SYSTEMS

Safe work practices begin with a full understanding and respect for potential hazards. Some of the hazards most frequently encountered while evaluating air pollution control systems are addressed in this section. Specific procedures to minimize risk to the inspector, plant personnel, and the plant equipment are specified.

5.3.1 General Safety Procedures

5.3.1.1 Personal Protective Equipment - Agency inspectors should bring with them whatever personal protective equipment is necessary to conduct the inspection of the facility. Facility personnel should not be asked to supply such equipment to the inspector. All personal protective equipment should be in good working order and the Agency inspector using it should be trained in its use and limitations.

5.3.1.2 Internal Inspections - Under no circumstances should Agency inspectors attempt to enter air pollution control devices or the associated process equipment. Even when units are out-of-service and locked off-line, numerous serious safety hazards can exist inside; these include but are not limited to asphyxiants, high concentration of toxic pollutants, hot free flowing solids, high gas temperatures, and high static charges. All of the information necessary to make a complete and accurate assessment of performance can be obtained without entry to the equipment.

5.3.1.3 Unaccompanied Inspections - The Agency inspector should insist that at least one responsible plant representative accompany him at all times. The plant representative can identify areas known to be unsafe (weak ladders and catwalks, poorly ventilated areas, moving equipment, spraying chemicals, high voltage cables in exposed locations) and can warn the agency inspector about intermittant plant operations which can result in health and safety risks, such as overhead cranes, molten metal transfer, and high temperature steam releases.

5.3.1.4 Warning Codes and Sirens - Prior to conducting an inspection of any plant, the inspector should learn the warning codes and sirens used at the plant to indicate blasting or emergencies such as plant fires, chlorine releases, ammonia releases, and vinyl chloride releases. The inspector should move to a safe location as rapidly as possible after hearing the warning sirens. Upon reaching a secure area, the inspector (and plant representative) should report in to the appropriate authorities so that no attempt is made to "rescue" them from the affected area.

5.3.1.5 Personnel Rescue - If an Agency inspector observes another individual who has been overcome, help must be summoned before any attempt is made to rescue the individual. Usually high concentrations of asphyxiants such as hydrogen sulfide, carbon monoxide, or oxygen deficient gases will persist in the area around the stricken person. Attempting to rescue the person can lead to the death of the rescuer unless the proper procedures are used. Rescue should be attempted only if the proper equipment is available to ensure the safety of the rescuer. The Agency inspector should never assume that he or she can hold his/her breath long enough to pull the stricken individual to safety.

5.3.1.6 Inclement Weather Conditions - Except in the case of public health emergencies, field activites should be interrupted or postponed whenever severe weather conditions present a significant safety risk to either the Agency inspector or the plant personnel accompanying the inspector. The specific criteria for interrupting or postponing the field activities should determined by each office with the assistance of the EPA Office of Health and Safety. As a general guideline, work should be delayed whenever the ambient temperature is less than -20°F (wind chill), the ambient temperature is greater than 100°F, the wind speed is greater than 25 mph, and/or whenever there are sleet and freezing rain conditions.

5.3.2 Walking and Climbing Hazards

5.3.2.1 Hard Hats - Agency inspectors should wear hard hats at all facilities being inspected regardless of whether they are required by the plant. These hats provide protection against collision with overhead beams and protuding obstacles. They also provide limited protection against falling objects. Each inspector should be aware not to drop the hard hat when working on elevated platforms, when bending over to reach measurement ports, or when bending over to obtain samples of liquor from ponds and tanks.

5.3.2.2 Safety Shoes - Agency inspectors should wear safety shoes approved for the specific type of facility being inspected. In all cases, the shoe should be slip resistant to minimize the risk of falls in wet and icy areas. Plant personnel should be consulted to determine if it is necessary to have shoes with conductive soles to prevent static accumulation, to wear shoes with wooden soles, or to have metataursal protection. Under no circumstances should street shoes or soft shoes (e.g. tennis shoes) be worn on inspections.

5.3.2.3 Gloves - Gloves should be worn whenever the inspection will involve climbing of ladders or handling of hot instrument probes. The gloves reduce the risk of burns on hot ladders and the risk of falls due to wet or muddy foot rungs. Gloves also reduce the risk of cuts on corroded or sharp foot rungs.

5.3.2.4 Slippery Areas - Portions of the facility with potentially slippery surfaces should be avoided to the extent possible. Common slippery areas include concrete surfaces under hoppers, areas adjacent to wet scrubber pumps, and oily surfaces. Icy surfaces along catwalks and in depressions around roof mounted collectors should be avoided.

5.3.2.5 Temporary Walkways - Inspectors should not use temporary "walkways" such as planks and horizontal ladders. Specially constructed temporary walkways should be used only when both ends are firmly secured, and the construction materials can take the intended weight.

5.3.2.6 Elevated Walkways - Before walking on elevated catwalks around control systems or leading to control systems, the inspector should confirm, to the extent possible, that the supports are intact and have not corroded or rotted.

5.3.2.7 Roofs - Accumulations of solids and snow can easily exceed the rated load bearing capacity of roofs. Furthermore, portions of the roof can be made of materials with only a limited load bearing capability. For these reasons, all roofs and other elevated, horizontal surfaces should be approached cautiously. It is recommended that inspectors follow plant personnel in such areas and that they remain on defined walkways.

5.3.2.8 Climbing Ladders (All Types) - In climbing any ladder, the foot rungs should be grasped while climbing even when the rungs are wet or muddy. Using the ladder side rails is never recommended since it is impossible in this position maintain a grip on the ladder if the feet slip off due to the wet or muddy conditions.

Under no circumstances should an inspector attempt to climb a ladder covered with ice or snow. Both hands must always be free for climbing ladders, therefore, portable instruments, probes, and sample bags must not be carried in the hands when climbing. Only one person should be on a ladder segment at a time (except in emergencies) to prevent injuries from falling objects.

5.3.2.9 Portable Ladders - Only portable ladders in good physical condition should be used. They should be inclined on an angle to minimize the chances of slippage or toppling and must have secure footing on the bottom to prevent slippage. The ladder must extend above the surface being reached by a minimum of 3 feet. lt must be a safe distance from high voltage electrical lines and out of the possible path of low elevation steam vents and pollutant vents.

5.3.2.10 Fixed Ladders - Only ladders in good physical condition should be used. The cage (if present) must have an opening ranging from 18 inches to 24 inches at the top. The cage should not be severly distorted since this would prevent easy movement inside. The ladder must have at least 9 inches clearance between it and where it is attached to allow secure placement of the feet on the rungs. The rungs must be evenly spaced. Ladders must be a safe distance from high voltage electrical lines. A caged ladder should extend at least three feet above the platform or surface being reached. Entry to a ladder at the top should be blocked by a chain or passive restraint.

5.3.2.11 Guard Rails - Guard rails should never be used for climbing. Also, the inspector should not aviod leaning against guard rails since the supports occassionally weaken.

5.3.2.12 Protruding Obstacles - While walking through the plant, inspectors must be alert for protruding obstacles such as conduit supports, beams, valves, conveyors, and support wires. Often these are difficult to spot in dimly lit portions of plants. It is advisable to wait several minutes for the eyes to adjust whenever entering an inside area from the outdoors.

5.3.2.13 Rotating Equipment - Loose clothing should not be worn when conducting an inspection since this can result in entrapment in rotating equipment. Ties are never appropriate. Exposed rotating equipment such as incompletely shielded sheaves should not be approached. Inspectors must be cautious when in the vicinity of all rotating equipment since it is often impoasible to see the components moving at high speed. Equipment which operates intermittantly, such as hoists, should never be touched since this equipment often starts automatically and without warning.

5.3.2.14 Elevated Platforms - Exposed platforms around air pollution control systems or around stacks should be left immediately if there is a release of toxic gases or steam from process equipment. These areas should also be avoided during thunderstorms.

5.3.2.15 Rail Sidings - Agency inspectors should stay at least 75 feet from all stationary rail cars at sidings since these are sometimes coupled to remote controlled engines run by an operator without a complete view of the siding areas. Also, areas near car pullers should not be approached since failure of the cable which pulls the cars can lead to serious injuries.

5.3.2.16 Material Piles - Agency employees should not stand on coal piles and other material stockpiles since it is possible to become entrapped in the conveying equipment which is often underneath these piles. Also, inspectors should not stand on fixed sludge lagoons since the material may not have much load bearing capability.

5.3.3 Eye Protection

5.3.3.1 Contact Lenses - Because of the possibility of hazaradous chemicals or gases becoming trapped under them or irritating the eyes while they are in, contact lenses should not be used during the inspection of air pollution control systems, the inspection of general plant processes, or the handling of any chemicals.

5.3.3.2 Safety Glasses - Field personnel should use prescription safety glasses while performing field activities. Side shields should be used whenever there is a possiblitity of exposure to flying materials. Splash goggles should be used in addition to the safety glasses whenever there is potential exposure to acid mist and/or liquid chemicals.

5.3.3.3 Minimizing Potential Eye Injuries - To the extent possible, inspectors should avoid areas directly underneath downward pointed vents and horizontal vents. The gas streams leaving these sources are often moving at 1500 to 3000 feet per minute and particulate in these gas streams is difficult to see in the large particle size ranges. Also, inspectors should not obtain liquid samples downstream of pumps (or in other high pressure locations) where splashing of the liquor is likely to occur because of the high line pressures. Inspectors should not lean over tanks containing chemicals in an attempt to assess hood capture effectiveness. Care must he taken whenever opening inspection hatches on incinerators or boilers.

5.3.4 Hearing Protection

5.3.4.1 Use of Hearing Protection - Agency inspectors should use hearing protection whenever required by plant policies and whenever it is difficult to hear another person talking in a normal tone of voice at a distance of 2 feet.

5.3.4.2 Minimizing Hearing Loss - To the extent possible, time spent in areas of the plant with high noise levels should be minimized. It is rarely necessary to spend extended periods of time in the vicinity of high noise equipment such as compressors, grinders, pulverizers, screens, steam vents, and fans.

5.3.5 Electrical Hazards

5.3.5.1 Ground Fault Interrupters - The agency inspector should not use line powered equipment or instrumentation not served by an approved ground fault interrupter.

5.3.5.2 Control Cabinets - Under no circumstances should an inspector open an electrical cabinet in an attempt to measure operating conditions such as fan or pump currents, or to evaluate the operational status of electrostatic precipitator automatic voltage control circuits.

5.3.5.3 High Voltage Lines - Prior to inspecting any facility, the inspector must ask responsible plant personnel to identify any high voltage cables in the area to be inspected. It is important to find any lines which could be inadvertently approached by long sampling probes and any lines which could be accidently touched while walking through the plant. It must be noted that it is sometimes difficult to identify these lines since some of the lines are incompletely labelled and sometimes identification signs become covered with dust.

5.3.5.4 Bonding of Probes - Agency inspectors should electrically bond all probes used downstream of electrostatic precipitators and in fiberglass ducts. The high static electricity charge which can develop on the probes can cause the inspector to have a severe involutary reaction which in turn can lead to a serious fall.

5.3.6 Explosions

5.3.6.1 Bonding of Probes - Agency inspectors should electrically bond all probes whenever making measurements in gas streams containing potentially explosive dusts. Due to the finely divided nature of the dusts contained in most air pollution control systems, static charges can accumulate on the probes due to the friction between the impacting particles and the electrically isolated probe. The build-up of static electricity on the probes can cause a spark within the duct which in turn can initiate an explosion.

5.3.6.2 Grounding/Bonding of Sample Bottles - Agency inspectors should electrically bond all sample bottles and funnels used to collect samples of fuel oils, waste oils, solvents, coatings and other flammable liquids. Prior to taking the sample, the adequacy of the ground line for the main storage vessel should be visually checked. To properly bond the sample bottle and funnel, both must be constructed of a conducting metal. Failure to take the sample in this manner can lead to a static electricity initiated explosion. Agency personnel should leave the plant while samples are being acquired if plant personnel fail to head warnings concerning improper sample acquistion techniques. Serious explosions are common due to this problem.

5.3.6.3 Portable Equipment - Agency inspectors should never take battery powered portable equipment such as non-explosion proof flashlights, pH meters, and thermocouples into portions of the plant where there are potentially explosive dusts and/or vapors. The equipment can be a source of ignition.

5.3.6.4 Smoking - Smoking materials, including but not limited to matches and lighters, should never be taken into any facility. Many areas of plants visited by inspectors can have explosive dusts and vapors.

5.3.6.5 Severly Vibrating Fans - The inspection should be terminated immediately whenever a severly vibrating fan is encountered. When a fan disintegrates, shrapnel can be sent over a large area resulting in very serious injuries. Plant personnel should be notified immediately if this problem is detected.

5.3.7 Burns

5.3.7.1 Hoppers - Agency inspectors should not stand in the immediate vicinity of hopper doors being opened and should not request plant personnel to open hopper hatches. Accumulations of hot solids can frequently be resting behind such doors even when the hoppers appear to be empty and cold.

5.3.7.2 Solids Handling Lines - These lines should not be touched since they are often carrying solids at several hundred degrees.

5.3.7.3 Probes - Sampling probes withdrawn from hot stacks and vents should be allowed to cool before being touched. The large port plugs commonly used should only be handled with gloves since they can remain hot for several hours after being removed from the stack.

5.3.7.4 Steam Leaks - In the event of high pressure steam leaks, the inspector should immediately follow the recommended safety procedures at the plant. If the inspector is in the general vicinity of the leak, such procedures generally require very little movement since it is practically impossible to identify the location of the leak. The inspector must be familiar with the plant warning codes in order to recognize the emergency and take the proper action.

5.3.7.5 Hot Ductwork - The areas immediately around hot ducts should be avoided to the extent possible.

5.3.7.6 Hot Roofs - Uninsulated hot roofs should be avoided to the extent possible. Unfortunately, many common sources such as coke ovens and asphalt concrete plants typically have hot roofs and it is sometimes necessary to visit these areas. In such cases, the proper foot wear must be worn. When climbing up to potentially hot roofs, gloves should be worn and the roof should not be touched.

5.3.8 Ionizing Radiation

5.3.8.1 Nuclear Instrumentation - Areas around damaged level detectors and flow monitors must be avoided since the lead shielding around the Cesium 137 radiation source can be damaged.

5.3.8.2 Flow Monitors - Under no circumstances should an inspector reach between the source and the detector of ionizing radiation type flow rate monitors such as those often used on sewage sludge incinerators.

5.3.9 Inhalation Hazards

5.3.9.1 Partially Confined Areas - To the extent possible, inspectors should avoid areas which allow the accumulation of airborne pollutants. Such areas are commonly found around air pollution control systems include weather enclosures on hoppers and roofs, fan houses, pump houses, walkways between compartments of the collector, protected areas near large ducts, and areas on top of floating roof storage tanks.

5.3.9.2 Selecting Respirators - The appropriate respirators should selected in accordance with the procedures discussed during basic and intermediate safety training and in accordance with EPA Administrative Order 1440.3, dated July 24, 1981 (and revisions). The latter specifies that each individual required to wear a respirator have training concerning the selection, use, fitting, and maintenance of the respirators. Furthermore, the respirator must not be worn whenever any condition would prevent a good seal. The most common reason for an improperly fitted respirator is facial hair.

5.3.9.3 Respirator Limits - Each inspector must understand the protection factor limits of each respirator. They must be used only for the specific contaminants listed and only for the concentration range listed. Since monitoring data is rarely available, the inspector must exercise some judgement when selecting the appropriate respirator. Selection of the type of respirator should never be done by smell or taste perception, since some of the most toxic pollutants cannot be detected at high concentrations.

5.3.9.4 Oxygen Deficient Atmospheres - Inspectors should use only a self-contained breathing apparatus or an air line respirator when entering areas believed to be oxygen deficient. Each individual using such a respirator must be trained in its proper fitting, use, maintenance, and storage. Under no circumstances should an inspector attempt to enter an air pollution control device or part of the process equipment using these respirators.

5.3.9.5 Respirator Maintenance - Proper inspection, maintenance, storage, and repair of respiratory protection devices are required by EPA Administrative Order 1440.3 to ensure that these devices protect the health and safety of employees when in use. The respirator must be inspected before and after each use (disposable respirators excluded). Equipment used only for emergencies will be inspected at least monthly. A record should be kept by date with the results of all inspections. All respirators must be cleaned and disinfected after each use. All filters and cartridges must be replaced whenever necessary. Replacement of other than disposable parts and any repair should be done only by personnel with adequate training and test equipment to ensure the equipment will function properly after the work is accomplished. Only certified parts supplied by the manufacturer for the product being repaired shall be used. The respirators should be stored in atmospheres that will protect them from dust, sunlight, extreme heat or cold, and damaging chemicals.

5.3.9.6 Eyeglasses in Respirators - The Agency should supply individualized eyeglasses mounted to the face piece of full face mask respirators, whenever such respirators are necessary for the field duties assigned. Spectacle temple bars or straps that pass between the sealing surface and the wearer's face prevent a good seal and should not be permitted with a full-face respiratory protection device.

5.3.9.7 Physical Limits to the Use of Respirators - Employees with perforated ear drums should not wear respirators. Employees who have not demonstrated, by means of regular physical examination, that they are capable of withstanding the additional physical stress imposed by respirators, should not wear respirators. Since respirators are necessary for field activities, such individuals should not perform field duties.

5.3.9.8 Contact Lenses and Respirators - Contact lenses should not be worn when Agency employees are wearing respirators [OSHA Standard 1910.134 (e) (5) (ii)]. A properly fitted respirator may stretch the skin around the eyes, creating the possibility that the contact lens will fall out. Also, in a full-face respirator contaminants penetrating the respirator could get under the lens and cause eye irritation; the user's first reaction might then be to remove the facepiece to remedy the situation.

5.3.9.9 Gum and Tobacco Chewing with Respirators - Agency employees should not chew gum or tobacco while wearing a respirator.

5.3.10 Use of Portable Instruments

5.3.10.1 Selection of Ports - Agency inspectors should not attempt to use measurement ports on positive pressure ducts or collectors that are more than 1 inch in diameter when the static pressure exceeds 1 inch of water. At this pressure, a high velocity gas stream, possibly containing toxic pollutants, can quickly engulf the area of the measurement port.

5.3.10.2 Positive Pressure Ports - All measurement ports under positive pressure must be opened carefully and be sealed while the measurements are being made. A glove is not recommended for sealing the port since leakage of gas around portions of the glove is usually significant.

5.3.10.3 Negative Pressure Ports - The measurement probe and associated equipment must be secured so that nothing is sucked into the ductwork or collector. This can result in significant damage to the plant air pollution control system, fan, and process equipment. It is recommended that ports less than 1 inch in diameter be used whenever the static pressures are less than minus 1 inch of water.

5.3.10.4 Lifting Equipment - When lifting large and bulky equipment to elevated platforms, a rope should be used rather than attempting to carry it up the ladder. Each article must be securely tied to the rope before been lifted. This should not be attempted if the wind speed is high, since it will be difficult to control the equipment being lifted. Under no circumstances should small tools, probes, or samples be allowed to drop from elevated platforms.

5.3.11 Heat Stress

5.3.11.1 Drinking Water - Each inspector working in moderate and hot climates should carry drinking water in the vehicle used. It is recommended that this water contain 0.1% by weight salt. It should be remembered that heat stress can occur while inspecting air pollution control systems even when the ambient temperatures are low. The close proximity of high temperature ducts and the limited air movement around portions of the control system provide

areas of high heat stress. The work involved in climbing to the various platforms around the control equipment and the work involved in making some of the measurements contributes to the heat stress conditions.

5.3.11.2 Heat Exhaustion - The inspection should be interrupted immediately whenever an inspector experiences the symptoms of heat exhaustion including but not limited to fatigue, nausea, vomiting, headache, dizziness, clammy skin, and rapid pulse. The affected individual should rest in a cool place which is not less than 75°F and seek medical care as soon as possible. Continuing the field activities during the onset of heat exhaustion can lead to heat stroke, a very serious condition requiring immediate medical help.

5.3.11.3 Heat Cramps - The inspection should be interrupted immediately whenever an inspector experiences heat cramps. The affected individual should find a cool place to rest and drink water containing 0.1% by weight salt (1 teaspoon per 5 quarts of water).

5.3.11.4 Appropriate Clothing - When working near non-radiant sources of heat, light clothing should be worn so that evaporative cooling is facilitated. In general, when the temperature is less than 100°F the clothing should be light and loose fitting. When the temperature is greater than 100°F, it should cover as much of the body as possible to decrease the convective heat transfer from the surrounding air.

5.3.11.5 Synthetic Materials - Synthetic materials should not be worn in areas where there is high radiant heat. It is possible for some of the synthetics to bond to the skin when the temperature is high. Work clothes should be composed primarily of cotton.

5.3.12 Cold Stress

5.3.12.1 Extreme Weather Conditions - Field inspectors should avoid portions of the plant exposed to high wind conditions or wet areas when the ambient temperature is low.

5.3.12.2 Appropriate Clothing - Clothing for inspections conducted during cold weather must be selected to provide the appropriate degree of protection and to reduce the chances of excessive perspiration accumulation. Clothing should generally be layered to trap heat and to provide the flexibility to adjust to both outside and inside conditions while conducting the inspection. Steel tipped shoes should not be worn whenever the ambient temperature is low. All shoes worn must be water tight.

5.3.12.3 Cold Weather Supplies - Field personnel working in areas prone to severe winter conditions (e.g. Minnesota, North and South Dakota, Montana, Wyoming, Utah, and Alaska) should include a winter survival kit in their vehicle. This should include but not be limited to flares, a shovel, sleeping bag, compass, drinking water, candle, food, and a two way radio. Each individual should be trained in the proper procedures to survive white-out conditions, and extended periods of extreme temperatures.

5.3.13 Skin Absorbable Chemicals

5.3.13.1 Personal Protective Equipment - Agency personnel should consult published reference materials concerning the selection and use of clothing (including gloves) whenever working with or near chemicals which are readily adsorbed by the skin. A partial list of such chemicals is provided in the OSHA Pocket Guide to Occupational Hazards.

5.3.13.2 Sampling - Agency personnel should exercise extreme caution when sampling liquids containing skin absorbable chemicals. Under no circumstances should the employee allow direct contact between such liquids and the skin (e.g. hands and arms) while acquiring a sample.

5.3.14 Transportation of Materials and Supplies

5.3.14.1 Compressed Gas Cylinders - All compressed gas cylinders transported in cars and trucks must be secured in accordance with D.O.T. Specifications. These should never simply be placed in the back of a station wagon, the back of a pick-up truck, or in the trunk of a car. These cylinders must be treated carefully.

5.3.14.2 Potentially Hazardous Samples and Supplies - All such materials must be packaged and transported in accordance with D.O.T. Specifications. This is necessary to ensure that the material does not leak during routine transport or following an accident.

5.3.15 Biologically Active Materials

5.3.15.1 Sampling - Agency inspectors should exercise extreme caution whenever sampling any solid or liquid material potentially containing bacteria and/or viruses. Such materials can be present in the scrubbing liquors for sewage sludge incinerators and in the solids fed to pathological waste incinerators. The proper personal protective equipment and proper sampling procedures must be used when acquiring samples.

5.3.15.2 Airborne Exposure - It is conceivable that bacteria and viruses can be entrained in the gas streams from improperly operating crematoriums and pathological waste incinerators. Exposure to the effluent from such sources must be avoided. Inspectors should seek guidance from the EPA Safety and Health Office concerning the proper personal protective equipment and other procedures to be followed during field work in the vicinity of such sources.

5.3.15.3 Fungi - Exposure to some forms of fungi common in the grain and feed industries can lead to serious health problems. The proper respiratory protection is necessary to minimize this exposure.

5.4 UNUSUAL AND EXTREME HAZARDS

While the EPA Administrative Orders concerning health and safety and the specific safety procedures outlined in Section 5.3 are believed to be appropriate for commonly encountered conditions, each inspector must realize that the safety procedures may have to be modified for unusual and extreme hazards at a specific site. It is the responsibility of the inspector, with the assistance of plant personnel, to identify these conditions. If there is

any question concerning the proper health and safety procedures, the inspection (or other field activities) should be interrupted until guidance can be obtained from supervisory personnel.

5.5 REFERENCES

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2. Occupational Safety and Health Standards, U.S. Department of Labor, Federal Register, Vol. 37, Number 202, October 18, 1972.

3. Richards, J. R. and Segall, R. R. Inspection Safety Procedures Workshop, Student Manual (Draft), Report under EPA Contract No. 68-01-6312, May 1984.

4. National Fire Protection Association, Static Electricity, Publication No. 77, 1983.

5. American Petroleum Institute, Recommended Practices Concerning Static Grounding, Manual 2003, 1982.

6. U.S. Environmental Protection Agency, Safety Manual for Hazardous Waste Site Investigations, Draft Manual Dated September 1979, Available from the Office of Occupational Health And Safety, Waterside Mall, 401 M. Street S.W., Washington D.C.

7. National Safety Council, Accident Prevention Manual for Industrial Operations, 6th Edition 1971.

8. U.S. Department of Health, Education and Welfare, The Industrial Environment - Its Evaluation and Control, 1973.

9. U.S. Department of Health, Education and Welfare, Occupational Diseases, A Guide to Their Recognition, Revised Edition, June 1977.

10. Norman V. Steere & Associates, Stack Sampling Safety Manual, Report under EPA Contract No. 68-02-2892, September 1978.

11. Patty's Industrial Hygiene and Toxicology, Third Revised Edition, Vol. 1, G. Clayton and F. Clayton, Editors, Wiley Interscience Publication, 1978.

6.0 VISIBLE EMISSION OBSERVATIONS

NOTICE: This chapter on visible emission observations is not presented in this draft of the manual because the Visible Emission Observation Form which was presented and discussed in this chapter is presently undergoing substantial revision based on agency technical and administrative peer review. The revised chapter (including the finalized Visible Emission Observation Form and corresponding instructions for its completion) will be published in the near future.

7.0 OBSERVING THE COMPLIANCE TEST

As outlined in Chapter 2, the Level 4 inspection consists of establishing a set of baseline process and control equipment operating conditions. This is accomplished by monitoring all process and control device parameters during a compliance stack test; these parameters, considered to be representative of emission levels during the test, can then be used for comparison during subsequent Level 2 and Level 3 inspections. The responsibility for collecting this data often falls to the air compliance inspector, since he/she will utilize it later. This task is often combined with the observation of the compliance test. This chapter addresses compliance test observation procedures as a whole, with emphasis on the aspects pertinent to the Level 4 inspection and the air compliance inspector.

7.1 INTRODUCTION

The stationary source performance or compliance test is an important part of compliance monitoring. Under current environmental regulations, a plant or facility that emits pollutants to the atmosphere must maintain the emissions at or below certain levels, as set forth in the applicable Federal, State, or local standards. Thus, an important aspect of the overall program of air pollution control is compliance testing, in which emissions are sampled and measured while the plant operates under typical conditions considered "representative" of day-to-day operations.

With the possible exception of comparison of data from several inspections to good continuous emissions monitoring data, the compliance test is the air compliance inspector's best opportunity to both (1) determine the conditions that the source considers as the optimal process and control equipment operationing conditions and (2) to compare these conditions to emissions in terms of the applicable emission standard. This constitutes a Level 4 inspection and can be best utilized in the inspection program when an inspector observes the process and control equipment operations and makes visible emission determinations (if applicable).

The compliance test observation involves two main objectives.

- To certify that the testing method is proper and in accordance with any pretest protocol established.
- To develop an engineering profile of process and control equipment operating conditions prior to and during the emission test which demonstrates that the test was conducted under "representative conditions" and also establishes a set of representative conditions under which the source's emissions are within the required limitations.

The set of conditions referred to above can then be used during subsequent compliance inspections as an indication of changes in plant operations, control device performance, or other parameters that could result in an increase in emissions.

Facility operation during the compliance test is of critical interest to the agency for several reasons. For example, during the initial compliance test the observer can usually determine the range of process and control equipment parameters that the plant operator and equipment supplier consider optimal for achieving compliance with the applicable emission standard. This information is useful not only for establishing representative operating conditions during this test or pretest protocols for subsequent emission tests, but also in selecting or evaluating stipulations of operating permits, and in assisting agency inspection personnel in evaluating future performance and continuing compliance status. The overall process of establishing this benchmark set of data on the facility operation is referred to as "baselining."

Establishing a baseline involves documenting all pertinent operating parameters as they relate to the emission characteristics of the source; this includes both process and control equipment parameters. The baseline provides a fixed point of operation or a narrow range of operating parameters against which other determinations may be made. The concurrent emission test provides a documented emission rate(s) that may be correlated with process and control equipment operating characteristics and, at times, visible emissions observations made during the test. The use of baseline values in later compliance inspections and obtaining baseline data for specific types of control equipment is discussed at length in Chapter 10.

If an opacity standard is also a requirement of the facility being tested, the agency observer generally has the responsibility of making the visible emissions determinations. These determinations can often be correlated with the mass emissions and so become part of the baseline.

The typical agency approach to the determination of compliance through emission testing is summarized in the following seven steps.

Step 1: Orient the agency staff and plant personnel concerning plant operations, emissions, and applicable regulations.

Step 2: Establish the requirement for a source test.

Step 3: Formulate written testing requirements for testing methodology.

Step 4: Conduct a planning session with test team and plant representatives to finalize testing procedures and perform a pretest survey.

Step 5: Observe the compliance test including both facility operations and testing methodology.

Step 6: Review the test data; determine compliance status and give official notification.

Step 7: Continue enforcement of compliance by performing follow-up inspections using data generated from the compliance test as baseline for comparison.

The principle function performed by the compliance test observation is to evaluate the representativeness of the compliance test itself. This evaluation is generally based on five criteria; if any one of these criteria is not met, the compliance test is considered nonrepresentative:[1]

- Process and control equipment must be operated in such a manner as to produce representative atmospheric emissions.
- Locations of the sample ports and sample points must provide samples representative of the atmospheric emissions.
- The sample collected in the sample train must be representative of the sample points.
- The sample recovered and analyzed must be representative of the sample collected in the sample train.
- The reported results must be representative of the sample recovered and analyzed.

The following subsections describe more fully the responsibilities of the observer as related to four phases of the compliance test: (1) preparation and planning, (2) conducting the test, (3) recovery, transport, and analysis of the sample, and (4) preparing the compliance test report.

7.2 PREPARATION AND PLANNING

The initial phase of any performance test observation is preparation and planning. During this phase the representative agency (either EPA or the state agency) defines, through written or verbal test guidelines for the test team leader and the plant representative, all procedures to be followed during the entire test program. These compliance test guidelines assist the test team leader in formulating a protocol for the compliance test that is compatible with agency requirements.

In instances where the compliance test being conducted is the initial performance test, it is often the case that continuous emission monitoring system (CEMS) performance evaluations are conducted simultaneously. (These performance evaluations are generally referred to as performance specification tests or PSTs.) Because the relative accuracy tests for sulfur dioxide and nitrogen oxides CEMSs involve use of the same methods employed for compliance tests, sources typically propose that the compliance test and CEMS PST be conducted concurrently. Test protocols can be easily prepared which provide for concurrent testing that meets applicable requirements. The nature and extent of preparation and planning efforts will be clearly affected by such concurrent PSTs; however, a discussion of such efforts is beyond the scope of this manual. Documents[2,3] are available which deal with PST observation; the reader is referred to these.

Prior to the establishment of a test protocol, the observer or other agency representative may need to conduct a pretest "walkthrough" (see Section 7.2.2) of the facility to locate and check operational status of process and control equipment instrumentation. This is used to assist in outlining recommendations for equipment operations and monitoring during testing and to draw up requirements for the facility to make repairs, calibrate, etc. of instrumentation that is not operating correctly.

The test protocol is then submitted to the agency by the test consultant or the plant representative. It is reviewed by the agency to confirm that it meets all agency requirements. In particular, the agency/observer gives close attention to (1) any deviations from standard sampling procedures due to certain processes, available sampling locations, and/or pollutants and (2) proposed operation of the facility during the compliance test. Based on the review, the protocol is generally finalized at the pretest meeting. With the test protocol agreed upon, the observer/inspector prepares for the actual test observation by further familiarizing himself with the plant and processes and gathering any checklists, date sheets, etc. that he will need on the day of the test. The following subsections describe each part of preparation in more detail.

7.2.1 Compliance Test Guidelines

Because the results of any compliance test may be contested, agency staff must be aware of potential legal implications of the compliance test. It is recommended that they prepare written guidelines and clearly delineate acceptable sampling procedures. They should inform the test team (usually from an independent, professional testing consultant firm) and the plant representative of all baseline or minimum conditions to be met in the test, and provide clear guidance for calculation and presentation of test data. Having developed these criteria, the responsible agency should then ensure that they are applied uniformly. Thus, any new or inexperienced agency staff members should be thoroughly trained before being assigned a responsibility as critical as compliance determination. The availability of written protocols can minimize the need for impromptu decision making by the agency observer during the compliance test.

Approximately half the states in the nation have written compliance test guidelines. If an agency has guidelines they should be used. If guidelines have not yet been developed, it is recommended they be written. Reference may be made to other agencies guidelines. The key items which should be addressed in the guidelines are listed below.

- Introductory Section - Reviews regulations authorizing agency to require performance tests.
- Procedures Section - Reviews agency administrative procedures.
- Protocol Section (Specific Information) - Lists required source, testing firm, and gas stream information.
- Protocol Section (Additional Information) - Lists additional information requested such as information on the sampling train and analytical procedures, sample data sheets, process description, and control equipment description.

7.2.2 Pretest Facility "Walkthrough"

In some cases, the agency may want to obtain certain facility information prior and subsequent to the pretest meeting and the compliance test itself. A pretest and post-test walkthrough of the facility is often used in obtaining process, control equipment, and monitoring data to confirm representative conditions during the test and to provide a sounder basis for baselining the facility. A pretest walkthrough is also used to check on the operational status of any process and control equipment instrumentation that will be used to monitor operating parameters. By performing these checks prior to the test, the agency can inform the plant representative of any work that needs to be done before the test such as repair and calibration.

It is recommended that the following be checked during a walkthrough.

- Sampling port locations (pretest walkthrough only).
- Process materials sampling locations (pretest walkthrough only, if required).
- Location(s) for making visible emission observations (pretest walkthrough only).
- Process operations, instrumentation and associated calibration factors.
- Control equipment operation instrumentation and appropriate calibration factors.
- Continuous emissions monitors and their data recording equipment.

7.2.3 Sampling Procedure Review

Prior to any compliance test the responsible agency must review the test protocol. A major part of this test protocol consists of an explanation of the sampling and analysis procedures to be used in conducting the compliance test. The agency must determine if the procedures described are in accordance with the regulations applicable to the compliance test. It is suggested that the observer use the test protocol review checklists found in Reference 1 to ensure that all significant points are reviewed.

In certain cases the protocol will entail modification of standard sampling procedures due to particular processes, sampling locations, and pollutants. In these cases the agency must determine whether the proposed modification will give results equivalent to or with a high bias compared to those which would be obtained with the standard method. More detailed information on making determinations of acceptable test protocols is available in References 4 and 5.

7.2.4 Establishing Representative Process Conditions and Baseline Values

Section 60.8(c) of the New Source Performance Standards states:[6]

> "Performance tests shall be conducted under such conditions as the Administrator shall specify to the plant operator based on representative performance of the affected facility. The owner or operator shall make available to the Administrator such records as may be necessary to determine representative operating conditions to be used while conducting performance tests."

If the testing is to be performed under the new Source Performance Standards, then the agency can take full advantage of this requirement by having the facility or test team submit a written test protocol describing representative process and control equipment operating parameters and mode of operation to be used during the compliance test. This is generally required even if the test is performed for other reasons. If the facility is told that their permit to operate, operation and maintenance, program and future inspections will be based on conditions recorded during the performance test, their testing protocol will more likely be detailed and realistic.

In general, standardized forms can be sent to the facility that will indicate representative conditions and the level at which the agency intends to baseline the facility. The items below show an example of the minimum that is generally agreed upon for future baseline use of the data.[1]

PRETEST AGREEMENT OF CONTINUING COMPLIANCE CONDITIONS

- Process
  - Process parameters that must be recorded and submitted to agency or kept on file for later inspection.
  - Percentage by which each process parameter can exceed the tested rate and on what time weighted average.
  - Future operating procedures.
- Control Equipment
  - Control equipment parameters that must be recorded and submitted to the agency or kept on file for later inspections.
  - Normal operating procedures.
  - Normal maintenance schedule.
  - Frequency of scheduled inspections by agency.

The second list shows the minimum items that should be agreed upon for the testing protocol as representative conditons.[1]

PRETEST AGREEMENT ON FACILITY OPERATION

- Process
  - Maximum process rate/capacity.
  - Method of process weight or rate determination.
  - Process parameters to be monitored and recorded, and their acceptable limits to document process operation.
  - Frequency of data collection during testing.
  - Raw material feed and/or fuel acceptable analyzed values.
  - Normal operating cycle or procedures.
  - Portions of the operating cycle that will be represented by each run.

- Control Equipment
  - Control equipment and effluent parameters to be monitored and recorded, and their acceptable limits to document control equipment operations.
  - Normal operating cycle (cleaning, dust removal, etc.).
  - Normal maintenance schedule.
  - Manner in which the control equipment will be operated.

The final agreement should establish the basis for the baselining of the facility. The agency observer may wish to describe the purpose for baselining of the facility to the plant personnel to give them a better understanding of what will be accomplished.

The baseline may be used for several purposes. First, for existing sources, baseline values may be obtained prior to a test to assist in the establishment of representative operating conditions. The normal range of values may be recorded during a period prior to a test and these values may be specified in the test protocol to establish representative conditions or to be used as a starting point in negotiating the test protocol with representatives of the plant. Comparison of compliance test parameters with those specified in the protocol is then used to establish whether the process and control equipment are operating during the test at representative conditions as specified.

Second, for new sources the initial compliance test provides values of operating parameters that correspond with measured emission rates and since for these sources there is no previous operating history, it also allows comparison against design values for process and control equipment. This provides a fixed reference point against which to compare future operating data to establish normal operating ranges. Third, documentation of the baseline data will assist in setting specific ranges on important parameters for inclusion into an operating permit (if required by the agency).

Fourth, and most important for the inspector, the values of the baseline parameters provide comparison data for evaluation of routine inspection results. By having knowledge of the effects of various process and control equipment operating parameters on emissions, comparison will assist in evaluating the direction and magnitude of any changes in performance. Finally, the baseline test provides a fixed reference point to compare long-term performance trends that are of particular interest in discussing aspects of continuous compliance. Proper evaluation of data may assist in establishing preventive maintenence schedules as well as provide an indicator for any design or installation problems that may exist. In addition, the rate at which the normal operating parameters move off from baseline values may assist the agency in scheduling routine inspections and periodic compliance tests.

The types of data recorded are dependent upon site-specific factors (i.e., the type of source or process, the product(s) produced, the control equipment installed). For that reason the observer and the inspector (if different from the observer) should be aware of the site-specific factors that affect the emissions, and take steps to obtain the appropriate data. See the detailed discussion of baselining in Chapter 10.

7.2.5 Pretest Meeting

Before compliance testing, the agency observer, the test team leader, and a plant representative with process control authority should meet to finalize sampling protocols, to establish representative operating and baseline conditions, and to coordinate the testing schedule. At this meeting the compliance test protocol is finalized and agreed upon by all parties. A pretest checklist can be used to organize the meeting and to ensure that all pertinent areas as listed below are discussed.

- Designation of Responsible Persons

  - Plant representative
  - Plant manager
  - Test team company
  - Test team representative
  - Person responsible for test team
  - Responsible agency
  - Agency representative
  - Person responsible for agency

- Pretest Plant Requirements

  - Safety requirements
  - Entrance requirements
  - Acceptability of sampling sites
  - Number of sampling points required
  - Diagram of sampling points

- Sampling Methodology

  - Pollutant
  - Method
  - Remarks, additional QA, modifications

- Pretest Agreement on Process Operation

  - Maximum process rate and method of determination
  - Parameters to be monitored and recorded
  - Acceptable composition of raw materials or fuel
  - Normal operating cycle
  - Portions of operating cycle to be included in each run

- Pretest Agreement Control Equipment Operation

  - Equipment and effluent parameters to be monitored and recorded
  - Normal operating cycle
  - Normal maintenance schedule
  - Control equipment operating procedure

- Pretest Agreement of Continuing Compliance

  - Process parameters that must be submitted to the agency or kept on file for inspection
  - Percentage by which process operations can exceed tested rate
  - Future process operating procedures
  - Control equipment parameters that must be submitted to the agency or kept on file for inspection
  - Normal control equipment operating procedures
  - Normal control equipment maintenance schedule
  - Frequency of scheduled inspections

- Review and Approvals

  - Tester on pretest agreements on facility operations
  - Agency on pretest agreements on facility operations and continuing compliance
  - Facility on pretest agreements on facility operations and continuing compliance

At the conclusion of the meeting, the test team supervisor must know the exact sampling procedures to be used, the minimum data requirements, and the conditions that constitute an invalid test. Likewise, the plant representative should know what process and control equipment parameters will be recorded, the intervals of data collection, the raw materials that must be used, and the conditions that constitute an invalid test. Since the agency observer has authority for approval or disapproval of the compliance test, he/she must be certain that all aspects of the test protocol are clearly understood at this time. Execution of the compliance test in accordance with the agreed upon protocol and facility operational conditions should constitute a valid test.

Some compliance tests of relativity simple processes may be routine enough that a pretest meeting on the morning of the test before sampling begins will be adequate to ensure complete understanding among all parties involved. In all cases, however, whether the process is simple or complex, it is the observer's responsibility to be certain that all details of the test procedure are understood and accepted before the test begins.

7.2.6 Observer Preparation

The observer must become familiar with the process to be sampled. Whenever possible the agency field inspector should be the "observer" for the process and control equipment. If the process is large or highly complicated, the observer may be aided by an agency process control engineer. An emission test performed at the wrong process rating or without sufficient process data will not be considered valid. The observer can familiarize himself with a specific process by consulting one or more of the many inspection manuals prepared by the U. S. Environmental Protection Agency. These manuals generally describe the process, indicate the methods and devices used in monitoring process rates and/or weights, and address methods of emission control and control performance evaluation.

The observer should also be prepared to handle any nonroutine situations that arise during the compliance test. Before the test begins, he should prepare a written or mental list of potential problems and possible solutions. The list should establish limits at which the minimum requirements for sampling and process rating are not met; for example, sampling may be unacceptable if the sampling box cannot maintain the filter at minimum temperature, and process rating is unacceptable if a power plant is unable to maintain full load because of poor quality coal. If the observer plans to use checklists, method modifications, anticipated problems, etc. should be noted on these. In preparing to meet such emergencies in testing, the observer must know who in his organization is authorized to make decisions that are beyond his capability or authority.

The number of persons scheduled to observe the compliance test must be adequate to ensure that (1) the facility operation (both process and control equipment) is monitored and recorded in a manner that provides a basis for

present and future evaluations of representativeness, (2) visible emission observations are conducted (if applicable) to use as an index of continuing compliance, and (3) the prescribed testing methodology is followed by the test team. With respect to item (2), as previously recommended, inspection personnel should be resposible for observing facility operations and taking visible emission readings during the compliance test.

7.3 DURING THE TEST

The attitude and behavior of the agency observer during the compliance test, are of utmost importance. He should perform his duties quietly and thoroughly, conversing with the test team and plant personnel as little as possible. If test procedures do not follow the established guidelines, the observer should deal solely with the test supervisor and plant representative or should have a clear understanding with them if it is necessary to communicate with the test team or plant operators. Conversely, he should refrain from answering queries from the test team and plant operators directly, referring such inquiries to the appropriate supervisor. The ideal emission test is one in which the data gathered is representative and no discussion of the test procedure is required.

During the test, the observer or observers must perform a number of tasks to ensure that the test is representative and to construct a baseline set of data. These tasks include (1) observation of sampling procedures, (2) on-site estimation of possible measurement errors, (3) observation of plant operational parameters, (including baselining and visible emissions observations) and (4) confirmation of normal facility operations during the test. All are covered in more detail in the following sections. Section 7.3.5 at the end presents suggestions for coordinating accomplishment of these tasks within the framework of the compliance test.

7.3.1 Observation of Sampling Procedures

During the test the observer must make a number of checks to confirm the test team's adherence to specified sampling procedures. These checks are aimed specifically at confirming the following two major points.

- The locations of the sample ports and sample points will provide samples representative of the atmospheric emissions.
- The samples collected in the sample train are representative of the sample points.

In most cases the observer should utilize a checklist or checklists covering the details of the sampling procedures to eliminate the possibility of overlooking any necessary checks. Example checklists for each of the EPA Reference Methods can be found in the Reference 1. These checklists contain all the necessary checks for the standard sampling methods. If the test team is using modified procedures of any type, the observer should modify or rewrite his checklists to reflect all modifications.

7.3.2 Measurement Errors

To gauge the relative importance of the measurement errors on stack test measurement of emission values, the observer must know the significance of each type of error. The procedure for determining pollutant emission rates by stack sampling involves measurement of a number of parameters. Errors of measurement associated with each parameter combine to produce an error in the calculated emission rate. Measurement errors are of three types: bias, blunders, and random errors.

Bias errors, usually a result of poor technique, cause the measured value to differ from the true value in one direction. This operator error often can be minimized by proper calibration and by adequate training in instrument operation. Most bias errors should have been eliminated with receipt of documentation of the calibration of emission measuring equipment in the pretest meeting. The observer may believe, however, that a one point field check of calibration is warranted. Minimizing bias errors requires diligent effort by skilled sampling teams who adhere closely to the prescribed methods.

Most blunder errors occur during collection, recovery, or transportation of the sample or during analysis. For example, if the sample nozzle is allowed to touch the inner stack wall and collects foreign material from the wall, the resulting error may be extremely large. Such errors are difficult to observe and the total effect cannot be calculated. Fortunately, most of these errors can be determined using common sense rationalization. Elimination of all blunders should be a main concern of the observer.

Random errors, which result from a variety of factors, cause a measured value to be either higher or lower than the true value. Such errors are caused by inability of sampling personnel to read scales precisely, poor performance of equipment indicators, and lack of sensitivity in measurement devices. The usual assumption is that random errrors are normally distributed about a mean or true value and can be represented statistically in term of probabilities. Determining the maximum expected error, however, does not require a strict statistical approach. It can be estimated by summing the maximum expected errors for each factor as explained in Reference 4.

7.3.3 Observation of Plant Operational Parameters

During the baseline compliance test, the agency observer must essentially conduct an inspection to obtain the operating parameters necessary for evaluating the test and constructing the baseline. The only major difference between this and a routine inspection is the fact that emission testing is occurring simultaneously. Process, control equipment, and other necessary parameters are checked throughout the test. As explained in Section 7.2.2 for pre- and post-test "walkthroughs", this data may also be obtained for the weeks previous to and after the stack test to further confirm representative conditions during the test.

As the initial part of this inspection, the observer should tour the facility ensuring that all monitoring equipment and sampling locations are acceptable, functional, and when necessary, calibrated. In particular, he should check the following items.

- Process operations monitors and their calibration factors.
- Process materials sampling locations (if required).
- Control equipment instrumentation and calibration factors.
- Location for making visible emissions determinations.
- Continuous emissions monitors and their data recording equipment.

If any of these items are not acceptable by test time, the facility contact should be informed that the problem must be corrected prior to the test for the test to be valid.

The status of CEMSs are checked when they are present and have been successfully performance tested. In this respect, the general operation of a CEMS is assessed based upon the status of fault lights and other easily accessed parameters such as the pollutant emission levels being measured. If, for example, fault lights are lit or if indicated emission levels are inconsistent with the nature of the process, the observer should note that the source's CEMS program may warrant attention by the control agency. Manuals which contain information dealing with the auditing of CEMSs are available.[7,8,9]

The process parameters monitored as part of the test are as numerous as the types of industry and, therefore, specific guidelines require site specific plans and will not be discussed here. However, process and control equipment parameters to be observed can be grouped under six general headings:

- Raw material inputs,
- Production (output),
- Fuels needed for the process,
- Mode of operation,
- Control equipment parameters, and
- Effluent characteristics (such as oxygen and carbon monoxide content).

Raw material characteristics that should be monitored include the quantity of all raw materials, chemical composition (including elemental analysis if needed), the size distribution of the feed materials (if

applicable), moisture content, and any feed cycles that are present if the raw material feeds are not continuous. All recycle loops should be included in the materials balance, as the amount and type of materials recirculated generally will affect emission rates. To the extent possible, continuous strip chart recorders are valuable in providing real-time data and should be used where available. Otherwise, visits to process monitoring areas at a reasonable frequency are necessary to provide adequate documentation.

The product characteristics should also be monitored including production weight, chemical and physical characteristics, particle size, density (specific or bulk), temperature and in the case of steam production, pressure. Although many of the characteristics are typically not measured during the test, those parameters that significantly affect performance should be measured for comparison with data obtained in the future. Care must be taken to protect the confidentiality of this data, if required by the plant, for it is in these areas that most sources are most sensitive about releasing data.

In those processes utilizing a fuel for heat input, the fuel type and heat content of the fuel should be specified. Other parameters that are commonly of interest are the sulfur content of the fuel, the ash content (not applicable to all fuels), and any chemical components that are included in the fuel that might affect the performance characteristics of the process and/or control equipment emisison rate or emission characteristics.

The final process check is the mode of operation. Many processes have several modes for which they can be operated. The two general modes are automatic and manual. However, there are many variations that would allow the facility to divert pollutants, shut down auxiliary or cleaning systems, change pollutant reinjection systems, or even extend the normal operating cycle. For many sources, the mode of operation is probably the most difficult parameter for which to determine representative operation. A process flow chart can be reviewed with the facility to discuss the options for operation. Only processes for which it is the normal mode of operation, may be controlled manually during the test. No cleaning (i.e., soot blowing) or other auxiliary systems should be shut down unless they rarely operate during the normal operations. All pollutant reinjection (e.g., fly ash reinjection, insufflation) systems should be in operation. Operational cycles that extend beyond their normal time should not be considered representative.

The establishment of baseline parameters for the control equipment is invaluable in determining operating characteristics and compliance capabilities during future routine inspecitons. As explained in the process parameter section, the mode of operation is important. Two types of control equipment are particularly amenable to baselining: ESP's and wet scrubbers. Fabric filters and mechanical collectors may also be baselined, but in many cases operation and maintenance play a major role in the long-term performance and there are relatively few indicators that are truly useful in the sense of baseline parameters.

The actual monitoring and recording of the facility operations is the responsibility of the facility. The observer's responsibility is to see that it is conducted in a proper manner and to report any changes that need to be made to the facility contact. The observer should never tamper with any equipment or handle or mark on any operating logs.

It is usually advisable during a compliance test to check the operating parameters on a routine schedule (half hour intervals) and to note any sudden changes that occur during the test period. Specifically, the observer must check to see that the process and control equipment are operating as prescribed in the test protocol and must determine if any significant shifts in parameters occur during or between test runs. If shifts do occur, it is the repsonsibility of the agency to determine the effect on emissions and whether the shift(s) compromise the representativeness of the emission test.

The emission test will provide the basic data for all control equipment, including gas volume, composition, and temperature, pollutant emission rate, and an average opacity. For each control equipment category the final disposition of the collected material should be determined (disposal provisions) by the observer. And, if a simultaneous inlet test is performed, the efficiency of the control equipment can be determined. The specific parameters to be monitored for each type of control device are discussed in the next Chapter in the section on constructing a baseline data set.

7.3.4 Coordination of Observation Tasks

The following paragraphs describe the recommended agenda for one observer to conduct a complete, typical test observation during the three test runs. Extra time, if available, should be used to conduct additional visible emissions observations. This additional data can prove useful at a later time should a company wish to obtain a variance for visible emissions.

7.3.4.1 The First Run - The observer should be present when the test team starts preparations. They will unpack the test equipment, check all equipment for damage, set up the sample recovery lab, and assemble the sampling train. The observer should inspect the sample recovery area and observe the assembly of the sampling train. Checklists (Reference 1) may be used to ensure that all items requiring attention at this period of the test are observed.

For the first test, after determining that the facility is operating as specified, the observer should go to the sampling site to observe the test team recording the initial data. He need not observe the initial leak check, since he will observe the leak check at the completion of the test. When the observer is satisfied with the sampling train preparation and that the facility is operating under representative conditions, he allows the test to be started. He should then observe the sampling of the first port and the changeover to sampling of the second port. If he is satisfied with the performance of the test team, he can go to a point at a suitable distance from the stack and read visible emissions for a 6-minute period.

He will then recheck facility operations. If the process and control equipment are operating satisfactorily and the data are being recorded as specified, he should again read visible emissions over a 6-minute period.

The observer can then return to the sampling site to observe completion of the test, giving close attention to the final readings and the final leak check. Following this should be the observation of transport of the sample train to the cleanup area and recovery of the sample.

7.3.4.2 The Second Run - If the observer is satisfied with all sampling procedures in the first test, he can spend most of the second test period in observing process operations and reading visible emissions. He may wish to spot check the sampling operation and/or be present at the completion of the sampling. During the second test he should make visible emission readings for two 6-minute periods and check facility operations between periods. He must still be satisfied that the data being recorded are representative of the facility operations.

If the sampling site is easily accessible, the observer may wish to observe the final data recording, final leak check, and transport of the sampling train to the cleanup area. In any case, he should witness the recovery of the second sample. A visual observation of particulate buildup on the filter and in the acetone rinse from the first two tests can be correlated with the visible emission readings to determine the observation emphasis for the final test. Comparison of particulate collected will be valid only if the sample volumes for both tests are approximately the same. If the particulate catch on the filter and in the acetone rinse for the second test is consistent with or greater than that indicated by the opacity readings for the first test, then the observer should continue surveillance of facility operations. If the particulate catch for the second run appears lower than is indicated by the opacity readings, he should return to observing the testing procedures.

7.3.4.3 The Third Run - Regardless of the observer's focus during the third run, he must perform certain observations during this final run. He/she should again check all facility operations prior to the run. He should again make visible emission readings for two 6-minute periods, with a check of facility operations in between. He should again witness sample recovery and compare the apparent particulate catch with visible emission readings. Finally, special attention should be given any suspected weak points or problem areas during this final run.

A summary of the recommended observation sequence is provided below.

- First Run Observations

  - Unpacking of test equipment, damage check
  - Sample recovery lab set up
  - Sample train assembly
  - Facility operations
  - Initial data recording
  - Sampling of first port
  - Port changeover
  - 6-minute VEO

- Second Run Observations

  - 6-minute VEO
  - Facility operations
  - 6-minute VEO
  - Final data recording, leak check, sample train transport (optional)
  - Sample recovery
  - Comparison of particulate catch to VE observations

- Third Run Observations

  - Facility operations
  - 6-minute VEO
  - Facility operations
  - 6-minute VEO
  - Facility operations or testing procedures
  - Suspected weak points and problem areas
  - Sample recovery
  - Comparison of particulate catch to VE observations

7.4 SAMPLE RECOVERY, TRANSPORT, AND ANALYSIS

Proper recovery, transport, and analysis of the sample is crucial to the compliance test. Test teams may not be well-versed in the legal requirements for documentation of these tasks. It is imperative that they are accomplished by standard procedures and that noncompliance with these procedures is well-documented. Because the test report may ultimately be subject to the requirements of the Rules of Evidence, it is suggested that the observer use a sample recovery checklist to ensure that all tasks are performed properly. Examples are contained in Reference 10, the QA Handbook Volume III.

7.4.1 Sample Recovery and Transport

To reduce the possibility of invalidating the test results, the responsible person must carefully remove all of the samples from the sampling train and place then in sealed, nonreactive, numbered containers. It is recommended that the samples then be delivered to the laboratory for analysis on the same day. (See Section 3.9 for additional information on chain of custody procedures.) If this is impractical, all samples should be placed in a carrying case (preferably locked), in which they are protected from breakage, contamination, loss, or deterioration.

The responsible person must also mark the sample properly to provide positive identification throughout the test and analysis procedures. The Rules of Evidence require impeccable identification of samples, analysis of which may be the basis for future evidence. Admission by a laboratory analyst that he is not positive whether he analyzed sample No. 6 or sample No. 9, for example, could destroy the validity of an entire compliance test report.

Positive identification must also be provided for any filters used in a test. All identifying marks should be made before taring the filter. Three or more digits should suffice to ensure the uniqueness of a filter for many years. The ink used for marking must be indelible and unaffected by the gases and temperatures to which the filter is subjected. If any other method of identification is proposed, it must be a positive means of identification and must not impair the function of the filter.

Finally, each container must be uniquely identified to preclude the possibility of interchange. The number of each container is recorded on the analysis data chain of custody sheet(s) associated with the sample throughout the test and analysis. (See Section 3.5.3 for more detailed information.)

Samples should be handled only by persons associated in some capacity with the task of analysis. A good general rule is "the fewer hands the better", even through a properly sealed sample may pass through a number of hands without loss of integrity.

It is generally impractical for analyst to perform the field test. The Rules of Evidence, however, require that a party be able to prove the chain of custody of a sample, and more importantly, the sample integrity. The use of standardized data sheets by the tester/analyst as show in Reference 10 should assist the tester in meeting these requirements.

7.4.2 Analysis

Potential sources of error in analysis lie in the sample, the analyzing equipment, the analytical procedures, and documentation of results. Since analysis is often performed at a laboratory distant from the test site, the agency observer usually is not present during analysis. The best method of checking the accuracy of the analytical system is through the use of an audit sample. Audit samples are available for most Reference Methods through EPA's Quality Assurance Division at the following address.

Environmental Monitoring Systems Laboratory
U. S. Environmental Protection Agency
Quality Assurance Division (MD-77)
Research Triangle Park, N. C. 27711

If the observer has any doubt about the ability or desire of the designated analyst to adhere to proper practices in analyzing and reporting data, the observer has two paths of recourse: (1) he may be present during analysis or (2) he may require that analysis be done by a certified laboratory, if one is available. The latter requirement is an unecessary burden and should not be imposed as a general rule. The most common and reasonable approach when the agency questions the results of the test is to perform another test with agency staff or under agency contract. To ensure proper execution of the required procedures, the observer may request that the analyst complete the appropriate analytical checklist contained in Reference 10.

7.5 COMPLIANCE TEST REPORT REVIEW

Upon completion of the compliance field test, the observer begins the final task of determining the representativeness of the compliance test data. An observer's report is written for attachment to the test team report. The facility operation data from the field checklists and field notes provide the observer with the information to determine the representativeness of the process and control equipment operation and the sample collection. Minimum conditions must have been met. If the observer suspects a bias in the results, this bias and its direction should be noted. A bias that can only produce emission values higher than the true emissions would not invalidate the results if the plant is determined to be in compliance, but should still be noted.

The test team supervisor is generally responsible for compilation of the test report, usually under the supervision of a senior engineer, who reviews the report for content and technical accuracy. Uniformity of data reporting enhances the speed and efficiency of agency review, hence the recommendation that the agency provide a report format and other guidelines to the test team supervisor (see Section 7.2.1). Recommended report format elements are listed below.

- Cover
  - Plant name and location
  - Source sampled
  - Testing company or agency, name and address
- Certification
  - Certification by team leader
  - Certification by reviewer (e.g., P.E.)
- Introduction
  - Test purpose
  - Test location, type of process
  - Test dates
  - Pollutants tested
  - Observers' names (industry and agency)
  - Any other important background information
- Summary of Results
  - Emission results
  - Process data, as related to determination of compliance
  - Allowable emissions
  - Visible emission summary
  - Discussion of errors, both real and apparent

- Source Operation

  - Description of process and control devices
  - Process and control equipment flow diagram
  - Process data and results, with example calculations
  - Representativeness of raw materials and products
  - Any specially required operation demonstrated

- Sampling and Analysis Procedures

  - Sampling port location and dimensioned cross-section
  - Sampling point description, including labeling system
  - Sampling train description
  - Description of sampling procedures that deviated from standard methods
  - Description of analytical procedures that deviated from standard methods

- Appendices

  - Complete results with example calculations
  - Raw field data (original, not computer printouts)
  - Laboratory report, with chain of custody records
  - Raw production data, signed by plant official
  - Test log
  - Calibration procedures and results
  - Project participants and titles
  - Related correspondence

The observer performs the first review of the test report. He should check all calculations and written material for validity, noting any errors and providing any necessary comments. Although the conclusions in the observer's report do not constitute final authority, they generally carry great weight in the final decision concerning the representativeness of the test. Because of the importance of the observer's report and the likelihood that it will be used as evidence in court, the observer should use a standard format that will cover all areas of representativeness in a logical manner. His report review form should parallel the report format provided to the test team leader and may include, if desired, all field notes and checklists. Figure 7-1 shows one suggested format for the review comments section of the observation review report.

In addition to the determination of representativeness of the compliance test, the observer reports the conditions under which the facility must operate in the future to maintain their conditional compliance status. These compliance test reports and the conditions of compliance acceptance provide the inspector with sufficient data for conducting future facility inspections.

Were calculations validated? _____yes _____no

If yes, were any calculation errors greater than normal round off errors? _____yes _____no

Were any sampling or analytical procedures unacceptable?
_____ yes _____ no

Were any process or control equipment operations unacceptable?
_____ yes _____ no

List any unacceptable items _____

_____

_____

List any additional items requested from the source or tester after report reviewed _____ yes _____ no

List items and reason for request _____

_____

_____

This report is _____ acceptable, _____ unacceptable give reason(s) for unacceptability _____

_____

_____

Comments reviewed by _____

Figure 7-1.

Suggested Format for Source Test
Report Review Comments.

7.6 SUMMARY

Clear written guidelines for stack testing that fully explain testing methodology and minimum data requirements, and provide a mechanism for obtaining data that can be used to specify future facility operating constraints and that anticipate expected testing problems, should be established. The successful compliance test requires close coordination between agency technical and legal staffs and extensive communication and coordination among the observer, the testing team, and plant representatives.

The observer is in a good position to assist the test team in obtaining valid compliance test results by advising them of any potential shortcomings that might compromise the test data. The observer should never, however, direct, interfere with, or intrude into the relationship of the plant representatives and the testing consultant.

The observer/inspector plays a key role by determining whether process operations during the test are representative of normal operations and are consistent with the accepted test protocol. Baselining testing, in particular, can form the basis for selection of indicative parameters that can be used (1) for comparative purposes during future inspections; (2) in establishing permit requirements; and (3) for comparisons of source to source performance. Baseline testing does require a division of effort between the actual stack test team observation and the process operation. However, the benefits generated far outweigh any inconvenience. Thus, during the emission test the agency obtains data useful in conducting future plant compliance determinations in addition to that used to determine the validity of the emission test results themselves.

7.7 REFERENCES

1. Evaluation of Stationary Source Performance Tests. Observation and Evaluation of Performance Test Series D. PEDCo Environmental, Inc., Durham, NC. Prepared for U. S. Environmental Protection Agency, Office of Air, Noise and Radiation. EPA Series 1-200. July 1982.

2. Guidelines for the Observation of Performance Specification Tests of Continuous Emission Monitors, EPA-340/1-83-009, January 1983.

3. Observer's Checklist Package for EPA Reference Test Methods and Continuous Emission Monitor Certification, (draft), EPA 340/1-80-009, June 1980.

4. Evaluation of Stationary Source Performance Tests. Emission Testing Concepts and Special Topics, PEDCo Environmental, Inc., Durham, NC. Prepared for the U. S. Environmental Protection Agency, Office of Air, Noise, and Radiation. EPA Series 1-100, July 1982.

5. Evaluation of Stationary Source Performance Tests, Special Problems and Concepts. PEDCo Environmental, Inc. Prepared for U. S. Environmental Protection Agency, Office of Air, Noise, and Radiation. EPA Series 1-300. July 1982.

6. Code of Federal Regulations. Title 40, Part 60. Standards of Performance for New Stationary Sources, revised as of July 1, 1983.

7. Performance Audit Procedures for Opacity Monitors, EPA 340/1-83-010, January 1983.

8. Performance Audit Procedures for SO_2, NO_x, CO_2, and O_2 Continuous Emission Monitors, EPA-340/1-83-015, January 1983.

9. Performance Specification Tests for Pollutant and Diluent Monitors: Reporting Requirements, Report Format, and Review Procedures," EPA-340/1-83-013, January 1983.

10. W. G. DeWees, D. J. von Lehmden, and C. Nelson. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III. Stationary Source Specific Methods. U. S. Environmental Protection Agency. EPA 600/4-77-027b. August 1977.

8.0 BASELINE INSPECTION PROCEDURES FOR AIR POLLUTION CONTROL SYSTEMS

Tbe primary objective of control agency inspections is to minimize air pollution through promoting adherence to promulgated emission regulations and permit stipulations. The inspection provides data for determining the compliance status, helps identify sources in violation, and provides information indicating the underlying causes of excess emissions. The latter can be used in detailed negotiations with the operators or in support of enforcement actions. The inspection also provides a stimulus to the regulated industry by demonstrating the control agency's determination to ensure continuous compliance. The Baseline Inspection Technique has been developed by EPA's Stationary Source Compliance Division to aid both EPA Regional Offices and other control agencies in conducting effective and complete inspections of air pollution control systems.

The primary purpose of this chapter is to describe the Baseline Inspection Technique and illustrate how it should be applied to the common types of particulate control devices. In the part of the chapter devoted to the Baseline Technique, a methodical approach is presented so that inspectors can obtain all the relevant data in a organized fashion. These procedures are organized into "Levels of Inspection" (see Section 2.3) reflecting the fact that there are different degrees of intensity necessary for different situations. The inspection procedures have been developed to ensure that the data obtained is as accurate and complete as possible; important safety considerations have also been included. These procedures should be used by EPA field personnel unless there are compelling technical or safety factors at a specific site which demand modified approaches. In such a case, the reasons for the deviation from the standard procedures should be briefly described in the inspection report.

Two introductory sections discuss two other important technical aspects of preparing for and conducting inspections of particulate control equipment. These sections address (1) how to assemble background material concerning specific industirial processes, control equipement operation and maintenance, procedures for conducting inspections of specific control equipment and processes, and (2) the inspection of potential sources of fugitive particulate emissions or fugitive dust.

8.1 ASSEMBLING BACKGROUND INFORMATION

The inspector's knowledge of the process(es) and the associated control equipment at a facility plays an important part in the success of an inspection, particularly in the diagnosis of control problems. It is therefore highly recommended that the inspector work at building his own and/or an agency technical library of books, reports, guideline documents, and other publications related to the inspection process. This should include materials addressing specific processes, operation and maintenance of all types of control equipment, and specific inspection procedures for various types of control equipment and industrial processes.

The remainder of this section offers a list of suggested sources for this type of information. Obviously, this list cannot be exhaustive, but it should in almost all cases serve as an excellent starting point for research into any of these subjects. The annotated list of information sources and contacts is as follows.

- Stationary Source Compliance Series Publications (340 Series) - These are issued by the Stationary Source Compliance Division (SSCD) of EPA. They cover inspections of the various categories of sources under NSPS and NESHAPS, VOC source inspection, emissions testing and CEM, VE observation, and compliance monitoring program development. A list of these publications as of June 1, 1985 is reproduced in Appendix B of this manual.

- EPA Library, Office of Research and Development - This EPA Library located in Research Triangle Park, NC carries EPA publications, books, and journals on all facets of air pollution control. It has copies of certain EPA publications (generally the EPA/340 series from SSCD and the EPA/450 series out of the Office of Air Quality Planning and Standards) available for distribution. The library can also provide information on how to obtain reports from other sections of EPA such as the Offices of Solid Waste, Pesticide Programs, and Toxic Substances. The address for requests is:

  Library Services Office (MD-35)
  U. S. Environmental Protection Agency
  Research Triangle Park, North Carolina 27711
  (919) 541-2777
  FTS: 629-2777

- Center for Environmental Research Information (CERI) - CERI is part of EPA's Office of Research and Development (ORD) and handles the ORD (EPA/600 series) publications. It, like the EPA Library in Research Triangle Park, has copies of certain EPA publications available for distribution. For information or publications contact:

  U. S. Environmental Protection Agency
  ORD Publications
  26 West St. Clair
  Cincinnati, OH 45628
  FTS: 684-7562
  (513) 684-7562

- Office of Research and Development Publications Announcement - This is published quarterly. EPA/600 reports are summarized and ordering information is provided. There is no charge for the subscription; send name and address to:

  ORD Publications
  P. O. Box 14249B
  Cincinnati, OH 45214

- EPA Regional Office Libraries - Each of the EPA Regional Offices supports a library which contains a large selection of EPA reports and documents along with other publications such as periodicals and abstracts of publications available elsewhere. Information concerning a library's holdings can be obtained by calling the appropriate Regional Office.

- Air Pollution Training Institute (APTI) - APTI, which is part of EPA's Manpower and Technical Information Branch, offers several different types of air pollution related training. These include self-instructional and correspondence courses which can be completed without traveling or time away form work and intensive short courses (3 1/2 to 5 days) covering specific aspects of air pollution control. Information on APTI training courses and materials may be obtained by writing to:

  Air Pollution Training Institute
  Manpower and Technical Information Branch
  U. S. Environmental Protection Agency (MD-20)
  Research Triangle Park, North Carolina 27711
  FTS: 629-2497
  (919) 541-2497

- National Technical Information Service (NTIS) - NTIS is part of the U. S. Department of Commerce which reproduces (for a fee) technical reports and publications generated by government agencies, departments, etc. A list of current publications available through NTIS can be found at all U. S. Government Document Depositories (found in many university libraries, federal libraries, large city libraries) around the country. Most EPA libraries carry the EPA Publications Bibliography which contains citations, abstracts, and indexes to all EPA reports entered into NTIS; it is issued quarterly. NTIS publications can be ordered using NTIS number (PB - #) and contacting:

  National Technical Information Service
  5285 Port Royal Road
  Springfield, VA 22161
  FTS: 737-4650 or
  (703) 487-4650

- Trade Journals - There are a number of air pollution control journals and other trade journals that generally publish air pollution control related articles. Some of the most useful include:

  - Journal of the Air Pollution Control Association
  - Environmental Science and Technology
  - Power
  - Pit & Quarry
  - Chemical Engineering

8.2 FUGITIVE DUST INSPECTION

Nonprocess fugitive particulate emissions commonly referred to as fugitive dust include particulate matter generated from nonindustrial activities such as travel on paved and unpaved plant roads; grain handling; mining; and fuel, feed, and waste storage piles.

Because of their significant impact on the ambient air quality it is becoming increasingly more important for fugitive dust sources to be taken into consideration during the air compliance inspection.

Although fugitive dust control measures are generally implicit in Federal air quality regulations, few include readily enforceable standards of performance, etc. However, a number of states have (as part of their implementation plan for total suspended particulate) developed and adopted rules to control fugitive dust emissions. These rules are enforceable by either state or federal air pollution control officials.

Clearly, a portion of the air compliance inspeciton should be devoted to identifying potential sources of fugitive dust emissions and the collection of data indicative of a source's compliance status with regard to applicable fugitive dust regulations. The following subsections (1) briefly outline the types of facilities and that are likely to have fugitive dust emissions and/or are likely to be affected by fugitive dust regulations and (2) offer recommendations on the types of data which should be collected during the fugitive dust related inspection.

8.2.1 Affected Sources and Industries

The following is a list of the most common sources of fugitive dust emissions. Many industrial facilities include at least one of these sources.

- Material stroage piles including fuel, feedstock, and waste
- Loading and unloading operations
- Conveying, transferring, and transporting of materials
- Crushing, grinding, mixing, screening, and compacting operations
- Paved roads and lots
- Unpaved roads and lots
- Construction/demolition sites
- Agricultural fields

Industries which are generally affected by fugitive dust emission regulations because their operations involve significant use of one or more of these types of sources are:

- Asphalt plants
- Cement plants
- Coal processing plants
- Concrete ready-mix plants
- Foundries

- Grain elevators
- Lime plants
- Municipalities, road crews, etc.
- Open pit mines
- Power plants
- Quarries
- Sand and aggregate screening plants
- Secondary metals plants
- Slag processing plants
- Steel mills

8.2.2 Fugitive Dust Inspection Procedures

As is the case for other types of emission sources, the inspector should prepare himself ahead of time and be familiar with potential sources of fugitive dust at the plant and applicable state/local and federal regulations and permit requirements. As seen previously in Section 3.2.1, the pre-entry evaluation from outside the plant is particularly important in regard to fugitive sources. During this evaluation, the inspector should, in particular, look for and note any fugitive emissions which cross or are near plant boundries and their source(s); conditions around feed, product, and/or waste storage piles; and any other obvious sources of fugitive emissions. Visible emissions readings and photographs should be taken at this time, as appropriate.

The portion of the fugitive dust inspection which is conducted within the plant boundries generally consists of four phases:

- Visual inspection of the facility in order to observe fugitive emission sources and any controls (including VE readings and photographs to document),
- Examination of the source's fugitive dust control equipment,
- Observations of any spraying or other dust control operations undertaken by source during the inspector's visit, and
- Examination of the source's relating to records relating to fugitive dust.

The following lists are offered as a reminder of key informantion to be collected by the inspector. They should be refined to according to the specific goals of the inspection and can be arranged in traditional checklist or chart formats if desired.

INFORMATION TO BE OBTAINED DURING VISUAL INSPECTION

- Fugitive dust emission points. Are all points listed in State permit/control plan still existent? Are there additional points that are not noted in the files?

- Control measures. For each control measure, note equipement, etc. and evaluate its effectiveness.

  - Enclosures, hooding - Is there a fan and control device associated with the enclosure?

  - Distance at materials drop points - Are telescoping spouts used? Is the system capable of varying the height?

  - Vegetation - What type(s)? Where planted?

  - Spraying - What suppressant is used? Frequency? Is a surfactant used? If so, what kind and in what dilution?

  - Stationary Spraying Systems - Are they located as indicated in files? Are they in use? Are nozzles plugged?

  - Vacuuming of paved roads and lots - What frequency? What type equipment? Describe, including model number.

  - Paving of roads and lots - Is paving work finished? Are paved surfaces vacuumed or flushed?

  - Other measures - Describe.

EXAMINATION OF CONTROL EQUIPMENT

- Types of equipment. Does equipment match the information from control plan files? List each. Does it appear to be well-maintained and recently used? Is there evidence that the source can and does make repairs to fugitive dust control equipment? Specify. Determine dilution rates of any chemical suppressants used, either at this stage or during spraying operations.

INFORMATION TO BE OBTAINED DURING SPRAYING OPERATIONS

- Observe areas to be sprayed. Do this at least twice, several hours apart, during the visit. Photographs may be appropriate; so may be VE readings. Determine if spray nozzles are plugged.

- Inquire about O & M procedures. Ask to see source's checklist and schedule.

- Examine reports re: spraying. How frequent are the applications? What amounts of water or chemical suppressants are used? Do these meet manufacturer's specifications?

- Examine any chemical suppressants. If requested, take a sample of each for follow-up laboratory analysis. Identify and cross-check with manufacturer's instructions for use.

- Inspect stationary spraying towers. Do they appear to be regularly operated?

INFORMATION TO BE OBTAINED FROM SOURCE'S FILES

- Copy of State permit to operate. Check for any conditions that pertain to source's operations. Ask if source is aware of existing rules. Note any fugitive dust controls needed.

- Copy of source's control plan. Does control plan address each needed control noted in State permit and thus comply with the permit?

- Resource program and assignments. Has staff been assigned to implement the control plan? Does a budget exist?

- Equipment purchases. Are there order forms and invoices that quantify equipment to be used in support of control plan? Note specific equipment, which can be expected to be seen outside the office. Include chemical suppressants as equipment, as well as fencing, ducting, vegetation, etc.

- Recordkeeping program. Are records being kept? Do they cover the duration of the control plan? Is there a current O&M schedule for implementing the control plan?

- Self-monitoring procedures. Note frequency of controls. Are there records of VE readings? Of surprise inspections by control plan supervisor?

- Maps of fugitive dust points. Do they exist? Do they locate any air monitoring stations?

- Stationary spraying systems using water or chemical suppressant. Do they correspond to fugitive dust points as mapped? Do they spray the proper liquid?

- Ambient air monitoring. Are they located appropriately to control fugitive dust emissions from large piles? Are the piles mapped?

8.3 BASELINE INSPECTION TECHNIQUE

The Baseline Inspection Technique can aid both the source operators and the regulatory agency inspectors in routinely evaluating air pollution control equipment performance. The procedure is designed to identify problems at an early stage, thereby minimizing periods of excess emissions and minimizing the equipment detereoration. By utilizing similar evaluation approaches, inspectors and operators can communicate effectively regarding the nature of any problems detected. This should facilitate the expeditious correction of operating problems and reduce the number of enforcement actions necessary.

8.3.1 Basic Principles

The fundamental principle underlying the Baseline Inspection Technique is that control device performance should be evaluated primarily by comparison of present conditions with specific baseline data. In other words, each seperate control device should be initially approached with the assumption that its operating characteristics and performance levels will be unique. It is necessary to take this position since there are a myriad of process variables and control device design factors, any one of which can singly or collectively influence performance. It is often difficult, if not impossible, to determine why apparently similar units operate quite differently. Thus, a prime requirement of an inspection method (i.e. the Baseline Technique) in ensuring the collection of useful data is the comparison of conditions against a site-specific data base. Each variable which has shifted significantly is considered a "symptom" of possible operation problems.

While the Baseline Technique depends mainly on the machine-specific data and shifts in performance levels over time, it should not be implied that industry "norms" are irrelevant. There are cases in which deviations from certain typical industry operating conditions can be an indication of operation and maintenance problems. However, this data is considered secondary to the site specific data. This industry data is often difficult to compile, and it is sometimes difficult to establish the relevance of the data in enforcement proceedings.

One of the major problems in conducting an inspection of an air pollution control system is that the instruments necessary to monitor basic operating conditions are often either non-existent or are malfunctioning. Data quality problems are especially severe on those units which are subject to frequent excess emission incidents and are thereby of most interest to control agencies. The design deficiencies or improper maintenance practices which have reduced the effectiveness of the control device usually have had a severe disabling effect on whatever instrumentation is on the control device. For these reasons, it is rarely wise to accept the data from on-site gauges at face value. The Baseline Technique includes some routine checks of these on-site gauges. When there is a question concerning the completeness or adequacy of the available data, the inspector must obtain the data by means of portable instruments. Such instruments can either be used by plant operators in the presence of the inspector or can be used by the inspector directly.

Performance evaluations should be done by examination of a number of different types of information. The type of emerging performance problem can often be determined better by evaluating the impact on the set of variables rather than relying on a shift in one operating variable. Also, general observations concerning the extent of corrosion, solids discharge rate, and fan physical conditions can be used to support preliminary conclusions reached by examining the operating data. Failure characteristics on materials removed from the collectors (e.g. bags, discharge electrodes, nozzles) can be used to determine the type of corrective actions which have a reasonable chance of being successful. The Baseline Inspection Technique incorporates both measurements and observations.

It is recognized that the control agency inspection represents an inconvenience to source personnel who must accompany the inspector while he is on plant property. To minimize this inconvenience, EPA inspectors should make

every reasonable effort to reduce the time necessary to complete the field activities. One means to accomplishing this goal is to organize the data and observations in a coherent fashion during the inspection and use this data to focus the field work toward the specific problems, if any, which appear to exist. If the initial information clearly suggests that there are no present or emerging problems, the inspection should be terminated. The Baseline Inspection Technique utilizes both "Counterflow" and "Co-Current Flow" approaches in order to organize and focus inspection efforts.

The Counterflow approach is appropriate when the EPA inspector is making a routine inspection of a facility for which baseline data is available. Such sources could include plants covered by an EPA enforced SIP, or a NSPS or NESHAP source for which the State agency has not received delegation of authority. Figure 8-1 illustrates the Counterflow approach. It starts with an observation of the stack opacity using Method 9 or equivalent procedures. In addition to the use of changes in the average opacity since the baseline period, the inspector evaluates the pattern of opacity variability. The inspector also checks for fugitive emissions from process areas and for emissions from bypass stacks and other unauthorized locations. The next step is the evaluation of transmissometer data assuming that the monitor passes basic quality assurance requirements. The emphasis of the inspection is on the control device operating conditions, both measured and observed. The control device information coupled with the stack conditions can be used to: (1) determine if there is a probable problem, (2) determine if the problem is due due primarily to control device related conditions, or (3) determine if the problem is due primarily to process related factors. If the process appears to be important, then the inspection should continue with an evaluation of any relevant portions of the plant. If the problem is simply control device related, the time consuming inspection of process sources can be either abbreviated or eliminated. The latter also reduces the liabilities involved in the acquistion and handling of confidential data. The Counterflow approach should only be used when the baseline data is available and the basic process operation is well documented in the agency files.

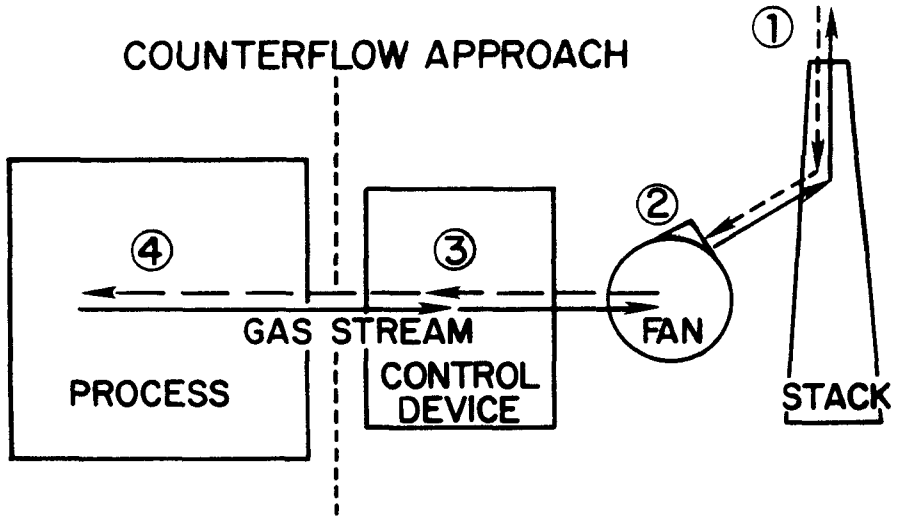


Figure 8-1. Counterflow Inspection Approach.

The Co-current Flow Inspection approach is performed on sources which inherently do not have air pollution control devices for minimizing emissions. A partial list of such sources include oil- and gas-fired boilers, indirect fired dryers, and refinery heaters. It is also performed on sources for which there are a number of emission problems related entirely to changes in process operating conditions, raw materials and additives, fuels, and overall equipment design. The Co-current inspection starts with the preparation of a flowchart of the process, including the locations of all vents and control devices. The inspector starts with raw material piles or storage piles and follows this material in a Co-current fashion through the mill. The emphasis in this type of inspection is on the raw material and fuel characteristics, operating rates, operating temperatures and pressures, and other information relevant to the generation of air pollutants. Major variables affecting the quantity, particle size distribution, and characteristics of the effluent gas stream should be noted to the extent possible. The Co-Current Flow approach is illustrated in Figure 8-2.

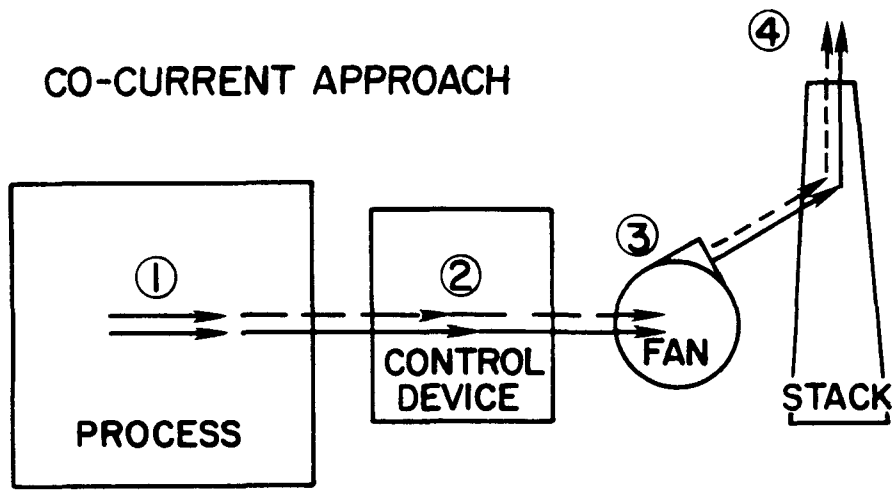


Figure 8-2. Co-Current Inspection Approach.

Due to the diversity of air pollution sources and control systems, it is important that the inspection procedures incorporate some flexibility. The Baseline Inspection Technique includes several "levels of intensity." These can be preselected by agency personnel before the inspection, based on normal targeting criteria. The level can also be changed by the inspector during the field work based on preliminary data and observations. This flexibility allows the agency to focus on actual emission problems instead of simply completing a prescribed number of "inspections." The flexibility built into the Baseline Technique must also be exercised whenever, in the judgement of the inspector, the standard procedures would be unsafe or incorrect for a specific source. It should also be noted that specific inspection activities can be deleted. However, inspectors are should not to add new or different procedures without the express approval of supervisory personnel.

8.3.2 Levels of Inspection

Without any constraints of Agency manpower and resources it would be desirable to conduct detailed engineering oriented inspections at all sources. This is obviously impractical due to the large number of air pollution sources inspected regularily by EPA Regional Offices and the State and local agencies. Levels of inspection have been incorporated into the inspection program to give control agencies the opportunity to properly allocate the limited resources available. The most complete and time consuming evaluations are done only when preliminary information indicates that there is or will soon be a significant emission problem.

The levels of inspection are designated at 1 through 4 with the intensity of the evaluation increasing numerically. The types of activities normally associated with each level and the experience levels necessary to conduct the different levels vary substantially.

The Level 1 inspection is a field surveillance tool intended to provide relatively frequent but very incomplete indications of source performance. No entry to the plant grounds is usually necessary and the inspection is never announced in advance. The inspector makes visible emission observations on all stacks and vents which are visible from the plant boundry and which can be properly observed given prevailing meteorological conditions. Odor conditions are noted both upwind and downwind of the facility. General plant operations are observed to confirm that these conform to permit requirements. Unusual conditions provide the stimulus for an in-plant inspection in the near future. If the visible emission observations and/or other observations will probably provide the basis on a Notice of Violation, the information should be transmitted to source management personnel immediately to satisfy "due process" requirements.

The Level 2 inspection is a limited "walk through" evaluation of the air pollutant source and/or the air pollution control equipment. Entry to the facility is necessary. Therefore, the administrative inspection procedures specified in Chapter 3 of this manual should be followed. The inspection can be performed either in a co-current or countercurrent fashion depending on the anticipated types of problems. In either case, the inspection data gathered is limited to that which can be provided by on-site permanently mounted instrumentation. An important aspect of this type of inspection is the evaluation of the accuracy of the data from this instrumentation.

When control devices are not in service during the plant inspection, the Level 2 inspections can include checks on the internal conditions. This is particularly useful for the evalution of fabric filter performance. The inspection involves observations from access hatches and under no circumstances includes entry into the collector by the inspector.

When the Level 1 data and/or the preliminary observations during Level 2 inspections indicate problems, an inspector may wish to conduct the more detailed and complete Level 3 inspection. This effort is done only on those individual units with apparent problems. Where necessary, portable gauges provided by the inspector are used to measure certain operating parameters.

The most commonly used types of instruments are listed below.*

- Differential Pressure Gauges
- Thermocouples and Thermometers
- Combustion Gas Analyzers (O_2 and CO_2 Monitors)
- pH Meters or Paper
- Pitot Tubes

The Level 3 inspection includes a detailed evaluation of stack effluent characteristices, CEM monitoring data, control device performance parameters, and the process operating conditions. Raw material and fuel analyses may be reviewed and samples of the scrubber liquor may be obtained for later evaluation. Failed bags or electrostatic precipitator discharge electrodes may be obtained to confirm that the plant has correctly identified the general type of problem(s). In some cases, the Level 3 inspection will include an evaluation of the internal portions of an air pollution control device. This is done simply by observating conditions from an access hatch and under no circumstances should include entry of the inspector into the control device. The internal checks are included only when the unit is locked-off line or when one or more compartments can be safety and conveniently isolated for evaluation.

The Level 4 inspection is identical in scope to the Level 3 procedures. This is done explicity to gather baseline information for use later in evaluating the performance of the specific sources at a given facility. This type of inspection should be done jointly by a senior inspector and the EPA personnel who will be assigned responsibility for the plant. Such inspections are conducted in conjunction with the stack tests on major sources such as large electrostatic precipitators, wet scrubbers, or fabric filters. With smaller sources which are rarely tested, the Level 4 inspection is done during a period when source personnel believe that the source is in compliance and the control device is working properly.

An important part of the Level 4 inspection is the preparation of general process and control device flowcharts. It is recommended that these be prepared in accordance with the guidelines presented in the section on flowcharting techniques for air pollution control equipment found in Reference 1. As a starting point, the inspector should request the block flow diagrams or drawings for the portions of the plants which are of interest. Specific flowcharts should be pre pared so that all of the important information concerning process flow streams, measurement ports, locations of vents and bypass stacks, and locations of all control deivces are clearly shown.

The following sections define the specific inspection points included in Level 1, 2, and 3 inspections of major types of air pollution control systems. Procedures involved in preparation of baselines (Level 4 inspections) are also covered since the procedures differ for each type of control system.

*A complete list of inspection equipment can be found in Table 3.1.

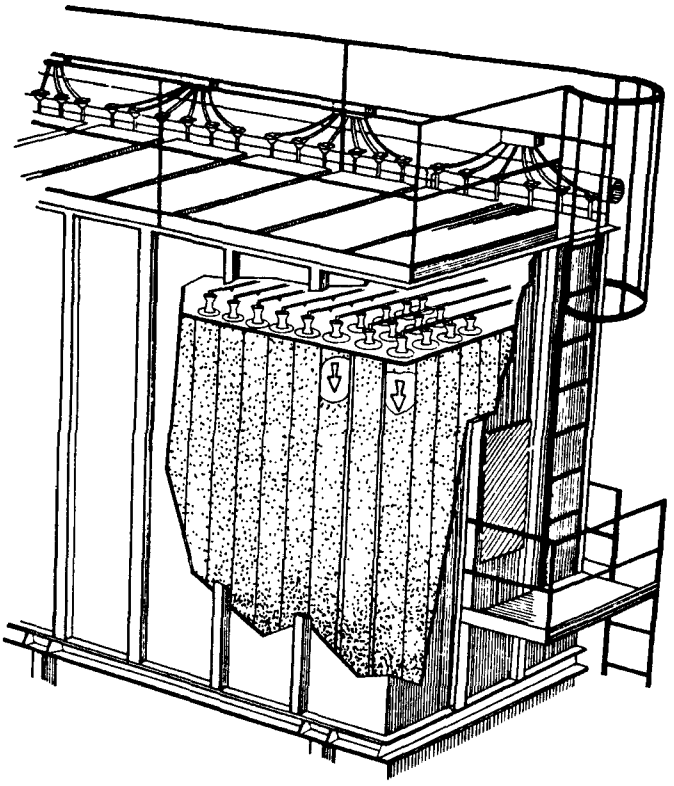
8.4 INSPECTION OF FABRIC FILTERS

Application of the Baseline Inspection Technique to the evaluation of fabric filter control systems is described in this section. Lists are provided of the necessary observations and data collection for inspecting the major categories of fabric filters. General approaches for efficient data aquisition are discussed. Each of the major types of fabric filters are briefly discussed at the beginning of this section. However, this does not substitute for a review of other background materials including the EPA training information concerning fabric filter systems (References 1, 2, 3, and 4). Inspection safety procedure (References 5 and 6, and Chapter 5 of this manual) should also be reviewed prior to any field work.

8.4.1 Descriptions of Major Types of Fabric Filters

The four major categories of fabric filters that are addressed in this manual are pulse jets, shakers, reverse air (inside-to-outside flow) and reverse air (outside-to-inside flow). Each is discussed separately due to major diffences in emphasis during the inspection.

8.4.1.1 Pulse Jet Fabric Filters - A pulse jet filter uses compressed air in the range of 50 to 120 psig for the routine cleaning of the fabric. The filter bags are supported on interior cages and hung from a tube sheet near the top of the baghouse. The arrangement of bags and the compressed air system are shown in Figure 8-3.



Source: APTI

Figure 8-3. Sketch of a Pulse Jet Fabric Filter.

The baghouse shown in Figure 8-3 is termed a "top access" pulse jet filter, since it is possible to enter the clean air plenum to change bags. With this design, the bag and cage assemblies are mounted in a way that permits easy removal from the top. Other pulse jet collectors, termed "bottom access" or "dirty side access" units, only have a hatch below the tube sheet to permit entry to the unit. With the bottom access designs, the bag and cage assembles are attached to nipples extending downward from the bottom of the tube sheet.

The gas to be filtered may enter the collector at any point below the elevation of the tube sheet. Those units with gas inlets near the tube sheet called "down flow" pulse jets are claimed to have more effective cleaning action since the dust released form a bag during pulsing has a tendency to move with the downward moving gases. An equally popular design has the gas inlet in the hopper area. The gas stream moves upward around the outside of the bags. This is obviously called an "upward flow" design. With both configurations it is common practice to install a deflection plate on the gas inlet to minimize abrasion of the bags.

The compressed air is received either from the plant air supply or from a compressor serving the pulse jet collector. Removal of the ambient moisture in the compressed air is often necessary to reduce operating problems in the pulse jet cleaning system and in the bags. Many systems also utilize an oil trap to remove the condensed lubricating oil which was added at the compressor. The compressed air is stored in a reservior at the top of the baghouse and this reservior often has a permanently mounted pressure gauge and a drain. The compressed air enters a series of diaphragm valves, each one serving a blow tube mounted above a row of bags. The operation of the diaphragm valves is controlled by an electrically activated solenoid valve, often termed the "pilot valve" When the solenoid is activated, compressed air trapped behind the diaphrapm can be exhausted up the trigger line and through the solenoid valve. This allows the diaphragm valve to open suddenly and causes a pulse of compressed air to enter the top of every bag in the row served by that blow tube. In the very large majority of pulse jet units, the cleaning is done row-by-row without taking the compartment off-line.

A plenum pulse baghouse is similar to the pulse jet baghouse except for the way that compressed air is delivered to the bags. These units have a number of small compartments which are isolated from the inlet gas stream during cleaning. The entire compartment is pulsed using a set of poppet valves. Individual blow tubes are not necessary. The pressures used in the cleaning operation are lower than those used in pulse jet collectors.

A cartridge type baghouse using compressed air cleaning is also similar to the pulse jet collector and is inspected in the same manner. The major design differences are the types of filtering media and the characteristically short filter elements. These are usually very small baghouses.

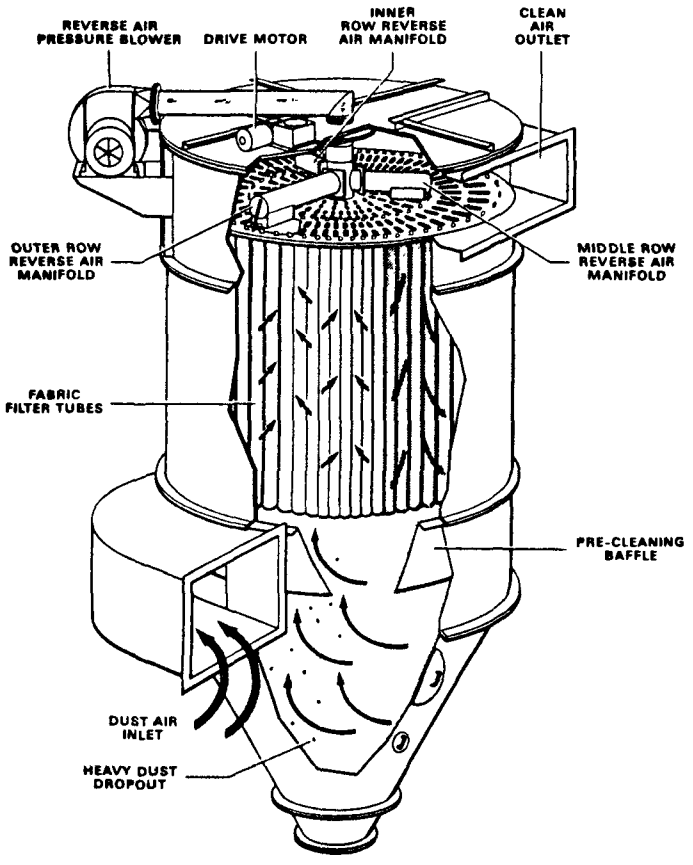
One of the commonly used design parameters is the gas-to-cloth ratio. This can vary from a low of 4 $ft^3/ft^2/min$ to as high as 20 $ft^3/ft^2/min$ depending on the type of cloth, the particle size distribution of the material, the particulate matter characteristics, the humidity, and the bag spacing. As the gas-to-cloth ratio goes up, there can be increased seepage through the material, increased gas velocities at the baghouse inlet, increased velocities around the bags, and greater tendencies for fabric holes.

The instrumentation generally installed on pulse jet and similar collectors is listed below:

- Static Pressure Drop Gauges
- Compressed Air Reserviour Pressure Gauge
- Gas Stream Inlet Temperature Monitor
- Fan Motor Current Meter

The majority of units have only the static pressure drop gauge. Compressed air reservior pressure gauges are useful to evaluate cleaning intensity, a factor which can directly relate to particulate emission problems. Such pressure gauges can usually be easily retrofitted to pulse jet compressed air reservoirs. The gas inlet temperature monitor is useful only when the system is operating at elevated temperatures and there is the potential for the condensation of corrosive materials or there is the potential for exceeding the rated temperature capability of the bag fabric. The fan motor currents provide an indirect, but nevertheless uselful, indicator of the gas flow through the baghouse.

8.4.1.2 Reverse Air (Outside-to-Inside Flow) - This style of fabric filter is geometrically similar to the pulse jet with the exception of the manner in which the fabric is cleaned. A sketch of one common type reverse air fabric filter (outside-to-inside flow) is shown in Figure 8-4.



Source:
Carter-Day Company

Figure 8-4. Reverse Air Fabric Filter (Outside-to-Inside Flow).

The bags are supported on interior cages and hang freely from a tube sheet near the top of the collector The particulate laden gas enters from the bottom and the gas stream passes up around the outside of each bag. The dust cake accumulates on the outside of the bags and the filtered gas passes up the center of the bags to the clean air plenum at the top. A rotating cleaning arm in the clean air plenum stops over each row of bags and introduces either ambient air or recycled filtered air in a reverse direction.

Another common style of reverse air fabric filter (outside-to-inside flow) has the bags arranged in a set of compartments. Each of these is equipped with poppet dampers, one to allow the filtered gas to exit the baghouse and another to allow the entry of reverse air.

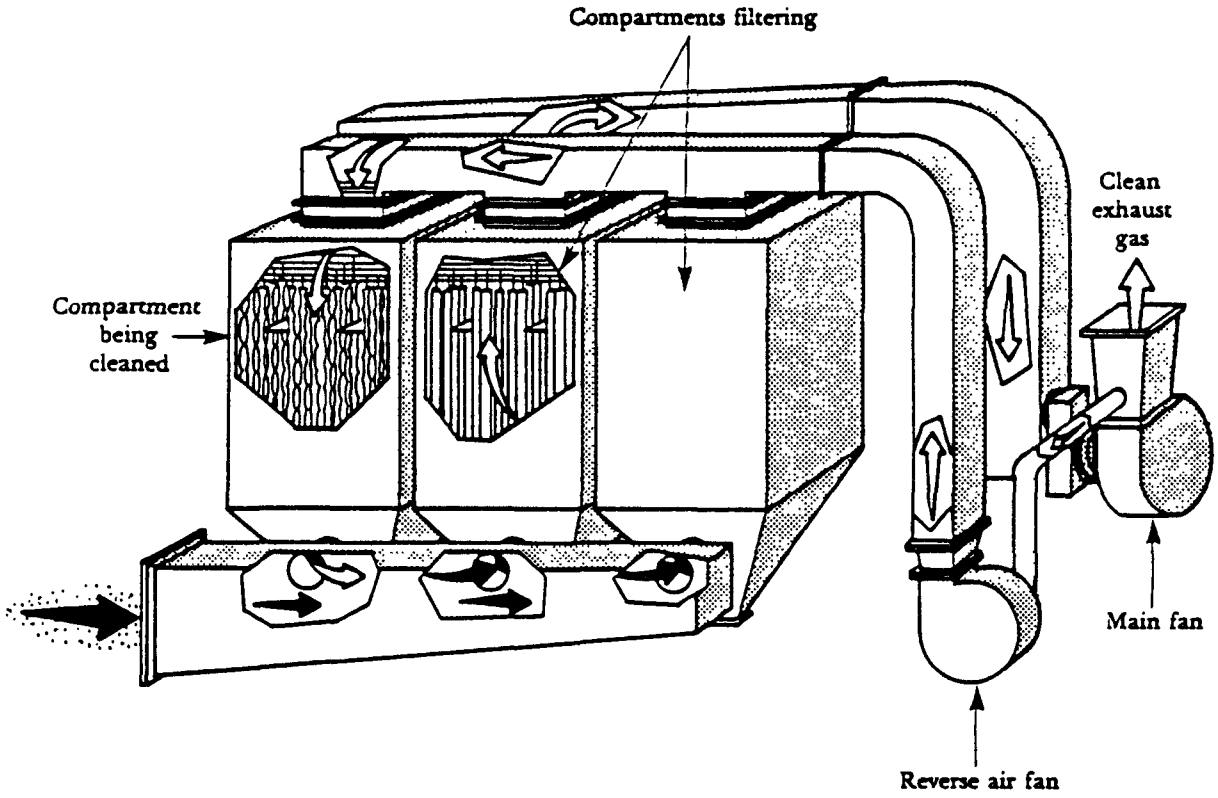
The instrumentation generally mounted on this type of fabric filter is limited to static pressure drop gauges. A few units may include a fan motor current meter.

The performance problems with these type of units are very similar to those discussed earlier for pulse jet collectors. The reverse air units operating at ambient pressure are obviously less prone to fabric attack during start-up and due to high temperature damage. Instead of compressed air and diaphragm valve problems, maintenance on reverse air (O/I) units must focus on the reverse air fan and rotating cleaning arm.

8.4.1.3 Reverse Air (Inside-to-Outside Flow) Fabric Filters - This style is generally used in moderate to large systems. The bags are hung from a top assembly fixed to a tube sheet which is positioned near the bottom of the baghouse. The particulate laden gas stream enters the hopper area below the tube sheet and gas flows up the center of each bag. The dust cake forms on the inside surfaces of each bag. The filtered gas is collected in the clean gas plenum which surrounds the bags. A number of separate compartments are used so that it is possible to isolate one compartment at a time for cleaning. Once the isolation dampers are activated, the reverse air fan supplies air to the clean gas plenum for a period of 15 seconds to several minutes. This air passes from the outside of each bag into the center of the bag and out the bottom exit. The dust cake is cracked and discharged due to the reverse air flow and the slight flexing of the cloth during cleaning. A typical reverse air (inside-to-outside flow) fabric filter is shown in Figure 8-5.

Reverse air (I/O) baghouses use woven cloths composed of numerous fabric types. Due to the relativley gentle cleaning action it is possible to use fiberglass which presently has the highest temperature limits of commercially available fabrics. Other common cloth materials include Nomex^{R}, Nylon^{R}, polypropylene, and Dacron^{R}. The bags are kept under tension to minimize fabric damage during the cleaning cycle and to reduce damage due to abrasion at the bag inlet. The gas-to-cloth ratios vary from as low as 0.5 ft^3/ft^2 min to as high as 3 ft^3/ft^2 min.

This type of baghouse can be operated under either positive or negative pressure. Those with negative pressure generally have one or two induced draft and a single stack. The positive pressure units often have individual vents above each compartment or a single roof monitor for the entire unit. The positive pressure units cannot be easily stack tested.

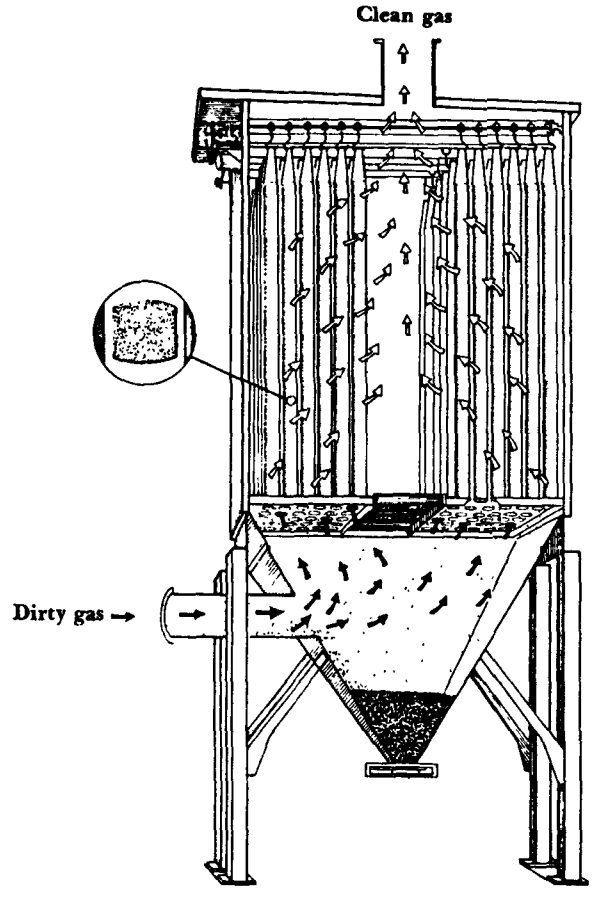


Source: APTI

Figure 8-5. Reverse Air Fabric Filter (Inside-to-Outside Flow).

Instrumentation used on reverse air (I/0) baghouses depends partially on the size of the unit and partially on the type of effluent gas being treated. Many of the large systems include a transmissometer on the exhaust stack (negative pressure systems). Most include static pressure gauges for each compartments and for the overall baghouse. Hopper level alarms and hopper heaters are common for those treating boiler or kiln processes. Some of the units which operate at elevated temperature have inlet gas temperature monitors.

8.4.1.4 Shaker Fabric Filters - Shaker collectors are geometrically similar to reverse air (I/0) fabric filters and are inspected in the same manner. The only major difference is in the way the bags are hung and the way dust is dislodged from the bags. With the shaker collectors, each set of bags is mechanically connected to a shaker motor which is usually outside the box. On a regular basis, a compartment is isolated from the gas stream and the bags are "shaken" from side to side. After the dust has had a chance to settle from the inside of the bag, the compartment is brought back on line. A sketch of a shaker assembly is provided in Figure 8-6.



Source: APTI

Figure 8-6. Shaker Fabric Filter.

Due to the severity of the cleaning action, the use of flex sensitive bag materials is not advisable. This limits the application of shaker units to low temperature operations with the most common materials being cotton, Dacron^{R}, polypropyplene, Nomex^{R}, and Nylon^{R}. Woven bags were used primarily in the past. However, some felted materials are now receiving some service in shaker units.

The types of instrumentation used on a shaker collector are usually limited to the static pressure drop gauges on each compartment and across the entire baghouse. Fan motor current meters are occassionaly used. Inlet gas temperature monitors are used for baghouses operating over 120°F. Shaker fabric filters can operate as either positive or negative units. However, the very large majority of these are designed for negative pressure.

8.4.2 Level 1 Inspections of Fabric Filters

The purpose of Level 1 inspections of fabric filters is to determine if the unit is operating in compliance with the visible emission requirements and if there are any fugitive emissions from the sources served by the unit. If the stack opacity exceeds 5% (well below most SIP, NSPS, and NESHAP visible emission limits) or there are noticeable fugitive emissions, a more detailed inspection would be necessary. Level 1 inspections are used for this source category since there are usually a large number of such collectors in most

areas. It may not be possible to see all of the fabric filters at a given plant from the plant boundry since many are small and are mounted very close to the point of particulate generation. The view is often hidden by adjacent buildings, ducts and other plant equipment. If the unit(s) cannot be seen from the plant boundry, the inspector must enter the facility to make the Level 1 inspection. This is obviously more time consuming for the inspector and can also represent an inconvenience to source personnel. The data and observations recorded during Level 1 inspections of pulse jet, reverse air (O/I), reverse air (I/O), and shaker fabric filters is presented in Table 8-1 at the end of this section. It should be noted that there is no difference in the Level 1 inspection steps for the four categories of fabric filters.

8.4.3 Level 2 Inspections of Fabric Filters

The Level 2 inspection is useful for confirming if the baghouse is operating is compliance with the visible emission regulations. Method 9 observations are made from a location close to the unit. Therefore, there are not problems with hidden units as there were with the Level 1 inspection. A counterflow approach is used starting with the visible emissions observation and proceeding opposite the direction of gas flow back to the point(s) of particulate generation. Pollutant capture problems at the originating sources are identified. Contributing problems such as corroded ductwork, open cleanout ports, and damaged hoods are observed and noted. If the capture problems seem to be due to the baghouse, the inspector must evaluate the present static pressure drop and the operating characteristics of the cleaning system.

It should be noted that the latter two factors are only evaluated after the initial counterflow inspection of the entire gas handling system (stack, baghouse, ductwork, and hoods) indicates a pollutant capture problem. The cleaning system is also checked whenever there is puffing from the stack at regular intervals. Level 2 inspection steps are tabulated in Tables 8-2 through 8-5 found at the end of this section. The different bag cleaning techniques utilized require three specific sets of Level 2 inspection procedures.

When the average opacity of the unit exceeds 5% to 10%, serious baghouse problems exist. The inspector must then evaluate maintenance records such as bag failure rate records, gas temperature data, static pressure drop data, and cleaning system operating data. The general type of problem causing the particulate emission can often be identified by the evaluation of this data in conjunction with diagnostic fabric testing. During the inspection, the "rip test" can be performed on recently removed bags if the source has not yet sent the bags for failure analysis.

During the Level 2 inspection, it is important to document that the process equipment is operating in a representative fashion. It is also necessary to confirm that the material being discharged from the fabric filter is not being reentrained and is being disposed of in a proper manner. In some cases, the baghouse discharge is hazardous material. Contamination of ground waters and surface waters must also be avoided.

Many fabric filters operate on an intermittant basis, and therefore, may not be operating during the time period of the inspection. In such cases, the inspection should be limited to evaluating the "clean side" conditions and other factors listed in Tables 8-6 to 8-8. Dust accumulation on the clean side of the tube sheet is a clear indication of operating problems. A follow-up inspection to document the excessive emissions is warranted in such a case. The inspection should also include a review of bag failure records, and other operating records for the unit.

8.4.4 Level 3 Inspections of Fabric Filters

Level 3 inspections are performed on fabric filters in response to problems identified in Level 1 or 2 inspections or for major units having chronic compliance problems. The objective is to gather sufficient information to thoroughly evaluate corrective actions proposed or taken by the operators to minimize future problems. A review of previous inspection reports and a review of relevant correspondance in the agency files are important prerequisites to the Level 3 inspection. Flow charts for the overall process and the fabric filter system should be brought on the inspection.

The inspector's efforts must be focused on the specific types of problems which have been reported. These are found in the following list:

- Emissions due to bag failures, poor unit fabrication, and other equipment related conditions.
- Fugitive emissions due to poor fabric cleaning and fabric blinding.
- Fugitive emissions due to air infiltration in ductwork and/or poor hood capture.
- Detached plume conditions.
- Reentrainment from solids discharge equipment or improper disposal of collected solids.

If high visible emission levels are noted, the problems at the least include high bag failure rates, fabric seepage, poor unit fabrication, or other similar problems. To characterize the main problems (there is rarely just one), it is necessary to measure the pressure drop and the inlet gas temperature. Air infiltration across the fabric filter can be estimated by measuring the inlet and outlet gas temperatures (elevated temperature units only). A difference of more than 10° to 20°F is indicative of significant infiltration. For units serving combustion sources, the change in the flue gas oxygen content before and after the unit is also useful for estimating the extent of infiltration. It is very useful to make a clean side check on at least one compartment of the fabric filter.

Fugitive emissions may be a result of deficiencies in the fabric filter, problems with the hoods and ventilation (ductwork and fans), or changes in the process operating conditions. The principal fabric filter related problems are blinding of the fabric, inadequate cleaning, and severe air infiltration.

The static pressure drop across the entire unit should be measured to indicate poor cleaning or blinding. Bags removed from the unit can be visually checked for blinding problems. Process related problems leading to fugitive emissions include improper start-up/shut-down procedures, air infiltration, improper hood conditions, and changes in process operating conditions. The impact of air infiltration problems can be quantified by means of a pitot traverse downstream of the fabric filter and possibly at several locations along the duct work leading to the fabric filter. A comparison of the hood static pressure against baseline levels can provide a useful index in the change in total gas flow rates at the hood.

While performing Level 3 inspections it is often necessary to evaluate the process operating conditions. Any changes in operating conditions or raw materials which could influence the quantity, particle size, and characteristics of the particulate are relevant to the inspection. Also, any changes which could result in an increase in vaporous material within the gas stream should be noted. While portable instrumentation is used less in the evaluation of the process conditions, it is usually helpful to measure the oxygen contents of all flue gases from combustion sources (except driers, gas turbines, and flares) and to measure the exhaust temperatures from most processes. The inspection of process equipment is most effectively done by starting with the raw materials (and fuels) and proceeding through the process in the same general direction as the effluent gas stream. This is termed the Co-current flow approach. The Level 3 inspection should only be conducted by experienced inspectors trained in inspection safety, in the use of portable instrumentation and in the performance evaluation techniques for air pollution control equipment. Level 3 inspections of the three main categories of fabric filters are summarized in Tables 8-8 through 8-10.

Safety considerations are extremely important. Portable instruments must not be carried through areas of high dust or vapor concentration since battery-powered instruments can be a source of ignition. The probes must be electrically bonded to prevent the accumulation of static charge. Hot equipment and port plugs must be handled carefully. Partially confined areas with poor ventilation must be avoided since the concentrations and types of contaminants may exceed the capabilities of the respirators normally used by inspectors.

8.4.5 Level 4 Inspections of Fabric Filters

Level 4 inspections are performed to obtain baseline data concerning both the baghouse and the associated process equipment. A necessary first step in a Level 4 inspection is the preparation of flowcharts for both the process equipment and the air pollution control system. Information on the preparation of these flowcharts is provided in Reference 1. Only data relevant to the performance of the air pollution control system should be obtained. Acquistion of potentially confidential data should be avoided unless absolutely necessary.

The best opportunity to obtain baseline data is during a Method 5 stack test of the fabric filter. Immediately prior to the stack test a quick walk-through inspection should be conducted to confirm that adequate measurement ports are available and to make any internal checks of the air pollution control device. During the pretest meeting, the inspector should also discuss what is to be considered representative operating conditions for both the process units and air pollution control system. During the test, one

inspector should be performing an inspection equivalent in scope to the Level 3 inspection (without the internal checks since this had been completed just prior to the test). All measurements should be repeated several times during the complete test period so that the data is representative of actual conditions. The steps in a Level 4 inspection of any fabric filter system can be used to supplement the baseline data set. The inspector should encourage baghouse operators to save several new bags of the type installed in the unit so that later diagnostic bag testing can be done.

Many units do not have stack sampling ports and some only have a fan discharge point rather than a defined stack. The positive pressure reverse air (I/0) filters usually have only a roof monitor for the exhaust gas stream. For these reasons, some units, especially pulse jet and reverse air (0/I), are rarely stack tested. The baseline data for these types of fabric filters is usually obtained during a period or periods when the unit appears to working properly. The criteria used to judge the adequacy of performance are:

- Visible emissions from the stack are < 5%.
- No apparent fugitive emissions from the process equipment.
- No solids reentrainment from the solids discharge equipment.
- Process equipment operating in representative manner.
- Negligible clean side deposits accumulation over several week period (or, unit passes tracer dust test).

Fabric filter and process data obtained during a period in which the above criteria are satisfied, will provide a very useful means of evaluating future operating problems. Data obtained in subsequent Level 2 and 3 inspections can be used to further document normal operating conditions for the system.

Baseline data can also be compiled for fabric filter systems which are not presently working in an optimum fashion. The nature of the present problem(s) should be noted in the inspection report, so that it is clear that some of the data and observations do not represent desired conditions. The scope of the Level 4 inspection for a unit with performance problems is identical to that described earlier with respect to Level 3 inspections. A summary of the data to be obtained in a Level 4 inspection is provided in Table 8-11.

TABLE 8-1. LEVEL 1 INSPECTIONS OF FABRIC FILTERS (ALL TYPES)

- Inspection Data and Observations
  - Method 9 observation of stack (or stacks) for not < 6 min; calculate average opacity
  - Method 9 observation of fugitive emissions from process equipment served by fabric filter; observe specific units, if possible; otherwise, check roof monitor and general plant areas
  - Presence or absence of visible emission spikes at fabric filter discharge or step changes in visible emission levels
  - Presence or absence of detached plume
  - Presence or absence of apparent shell corrosion
  - Presence or absence of settled dust in the vicinity of unit
  - Presence or absence of high settled solids levels in downwind areas
  - Presence or absence of dust reentrainment from discharge

- Evaluation
  - Visible emissions > 5%, warrant a follow-up inspection (Level 2 or 3); properly operated units operate with essentially zero opacity
  - There should be no apparent visible emissions from process areas served by the fabric filter; however, a number of problems increase resistance to gas flow and thereby decrease the effectiveness of pollutant containment at the process source
  - Presence of a detached plumes suggests that vaporous material is passing through the fabric filter and condensing upon entering the cold ambient air; co-current flow inspection of the process and raw materials is necessary
  - Settled material in the vicinity of the stack or in downwind areas suggests poor baghouse performance; excessive emissions of large particle size material can occur without any apparent "visible" emissions
  - Corrosion of the baghouse shell can indicate improper baghouse operating conditions or the use of process raw materials with corrosive components; fuels contaminated with PCBs may also induce severe corrosion

- Safety Considerations
  - Location(s) selected for observations should be protected from moving vehicles (cars, trains,heavy equipment) and should provide secure footing; coal and material stockpiles are not suitable

- Special Notes
  - Avoid trespassing on private property to obtain a good location for observations (unless public access is allowed); if plant entry is necessary to observe the equipment, the normal entry procedures are applicable
  - If the observations will probably form the basis for a NOV, results should be provided to source as soon as possible

TABLE 8-2. LEVEL 2 INSPECTIONS OF PULSE JET FABRIC FILTERS (OPERATING SYSTEMS)

- Inspection Steps
  - Method 9 observation of fabric filter discharge
  - Method 9 observation of fugitive emissions from solids handling operation (if reentrainment)
  - Method 9 observation of fugitive emissions from process equipment
  - Counterflow checks of audible air infiltration into fan, baghouse (solids discharge valve, access doors, shell), and ductwork; check physical condition and location of hoods
  - Check static pressure drop across baghouse using on-site gauge; compare with baseline data
  - Compare compressed air pressures at reservior with baseline values; check for audible leaks of compressed air at fittings; check operation of diaphragm valves, record number of valves which do not appear to be working properly
  - Check inlet gas temperatures using on-site gauge
  - Observe and describe corrosion of fabric filter shell and hoppers
  - Evaluate bag failure records, gas inlet temperature records, pressure drop data, and other maintenance information

- Evaluation
  - Visible emissions > 10% indicate poor performance; inspection should include: evaluation of bag problems, including but not limited to abrasion, chemical attack, ember damage, high temperature damage, and improper cleaning; rip test should be done on failed bags unless quantitative fabric tests have been performed; if conditions appear to be severe, a Level 3 inspection (primarily clean side checks) is recommended
  - Fugitive emissions from all process sources should be carefully documented; reasons for poor capture should be investigated, and include air infiltration, poor hood condition or location, fan belt slippage (listen for squeal), fabric blinding, and poor cleaning effectiveness
  - Static pressure drop data and cleaning system performance checks (compressed air pressures, conditions of diaphragm valves, and frequency of cleaning) are very important
  - Check of the entire system for air infiltration is very important, since it can lead to severe problems

- Safety Considerations
  - Level 2 inspection involves some climbing and close contact with the pulse jet baghouse; check the integrity of all supports and ladders; climb ladders properly; avoid contact with hot ducts and roofs; avoid downward point gas discharge points
  - Since the inspector must enter the facility to conduct a Level 2 inspection, all facility and agency safety precautions apply

- Special Notes
  - All normal legal considerations applicable to on-site inspections apply

TABLE 8-3. LEVEL 2 INSPECTION OF OPERATING REVERSE AIR (OUTSIDE-TO-INSIDE FLOW) FABRIC FILTERS

- Inspection Steps
  - Method 9 observation of the fabric filter discharge
  - Method 9 observtion of fugitive emissions from solids handling operation (if reentrainment) is occurring
  - Method 9 observation of fugitive emissions from process equipment
  - Counterflow checks of audible air infiltration into fan, baghouse (solids discharge valve, access doors, shell), and ductwork; check physical condition and location of hoods
  - Check static pressure drop across baghouse using on-site gauge; compare with baseline data
  - Confirm that reverse air fan and drive motor for rotating cleaning arm (if present) are operating
  - Check inlet gas temperature using on-site gauge (if present)
  - Observe and describe corrosion of fabric filter shell and hoppers
  - Evaluate bag failure record, gas inlet temperature records, pressure drop data, and other maintenance information

- Evaluation
  - Visible emissions > 10% indicate poor performance; inspection should include: evaluation of bag problems, including abrasion, chemical attack, ember damage, high temperature damage, and improper cleaning; rip test should be done on failed bags unless quantitative fabric tests have been performed; if conditions appear to be severe, a Level 3 inspection (including clean side checks) is recommended
  - Fugitive emissions from all process sources should be carefully documented; reasons for poor capture should be investigated, and include air infiltration, poor hood condition or location, fan belt slippage (listen for squeal), fabric blinding and poor cleaning effectiveness static pressure drop data are very useful
  - Check of the entire system for air infiltration is very important, it can lead to severe problems

- Safety Considerations
  - Level 2 inspection involves some climbing and close contact with the reverse air unit; check integrity of all supports and ladders; climb ladders properly; avoid contact with hot ducts and roofs; avoid downward pointed gas discharge points
  - Since the inspector must enter the facility to conduct a Level 2 inspection, all facility and agency safety precautions apply

- Special Notes
  - All normal legal considerations applicable to on-site inspections apply

TABLE 8-4. LEVEL 2 INSPECTION OF OPERATING SHAKER AND REVERSE AIR (INSIDE-TO-OUTSIDE FLOW) FABRIC FILTERS

- Inspection Steps
  - Method 9 observation of fabric filter stack or individual compartment discharge points
  - Check operating condition of transmissometer; then average opacity and variations in visible emissions
  - Method 9 observation of fugitive emissions from solids handling operation (if reentrainment)
  - Method 9 observation of fugitive emissions from process equipment
  - Counterflow checks of audible air infiltration into fan, baghouse (solids discharge valve, access doors, shell), and ductwork; check physical condition and location of hoods
  - Check static pressure drop across collector using on-site gauges
  - Check static pressure drop across each compartment during cleaning; values should be zero for shaker collectors
  - Confirm that reverse air fan or shaker motor is operating
  - Check inlet gas temperatures using on-site gauges
  - Observe and describe corrosion of fabric filter shell and hoppers
  - Evaluate bag failure records, gas inlet temperature records, pressure drop data, and other records

- Evaluation
  - Visible emissions > 5% indicate poor performance; inspections should include: evaluation of bag problems, including abrasion, chemical attack, ember damage, high temperature damage, and excessive cleaning intensities; rip test should be done on failed bags unless quantitative fabric test have been performed; if conditions appear severe, a Level 3 inspection is recommended
  - Detached plumes are often due to the condensation of vaporous material; a co-current flow inspection of process operation and a check of raw material characteristics may help identify reasons for vaporous material
  - Fugitive emissions from all process sources should be carefully documented
  - Static pressure drop data and cleaning system performance checks (compartment static pressure drops during cleaning, operation of reverse air fan) are very useful for determining if the problem is due to the unit
  - Counterflow inspection of the entire system for air infiltration is very important since it can gradually lead to severe bag damage, and reduced capture effectiveness at the process

- Safety Considerations
  - Level 2 inspection involves some climbing and close contact with the unit; check the integrity of all supports and ladders; climb ladders properly; avoid contact with hot ducts and roofs; avoid poorly ventilated areas under hoppers and between compartments
  - All plant and agency safety procedures for on-site inspections apply

- Special Notes
  - All normal legal considerations for on-site inspections apply

TABLE 8-5. LEYEL 2 INSPECTION OF PULSE JET FABRIC FILTERS (NONOPERATIONAL SYSTEMS)

- Inspection Steps
  - Confirm that unit is out-of-service and will not be brought on line during period of inspection
  - Request plant personnel to open one or more access hatches on clean side of unit; evaluate quantity and pattern of clean side deposits
  - Check orientation of blow tubes (and extension nipples, if present)
  - Check for obvious poorly seated bags and gaps in tube sheet welds
  - Request that plant personnel open side access hatches if available
  - Check for bag abrasion against side flanges, internal walkways, and other bags; check for bowed and bent bag/cage assemblies
  - Check the condition of any deflector plates on the gas inlet
  - Check for obvious erosion of ductwork leading to baghouse
  - Check operation of bag cleaning equipment

- Evaluation
  - Presence of clean side deposits (enough to make a footprint) indicates poor performance; inspection should include an evaluation of bag failure problems due to abrasion, excessive cleaning intensities, improper blow tube alignment, chemical attack, ember damage, and high temperature damage; a rip test should be conducted if quantitative fabric test data is not available; potential for leakage around top of bag and tube sheet should also be checked
  - Potential for bag-to-bag abrasion at bottom and for damage of the fabric against side flanges and internal walkways can be seen from side access hatches
  - Deflector serves to protect the bags from abrasive materials
  - Erosion of these plates could contribute to premature failures; eroded ductwork could lead to reduced pollutant capture at the generation source and operating temperatures below the acid dewpoint

- Safety Considerations
  - Hatches located on hoppers should never be opened during an inspection since there is often dangerous accumulations of hot, free flowing solids behind door
  - Inspector should never stick his or her head into the clean air plenum since this poorly ventilated area may contain asphyxiants and/or toxic gases
  - Pulse jet units serving combustion sources should never be opened immediately after shut-down since the inrush of ambient air may cause an otherwise innocuous ember to flare into a baghouse fire
  - All hatches must be opened carefully to prevent hand injuries

- Special Notes
  - Presense of clean side deposits or other abnormal conditions cannot be used alone as a basis for a NOV
  - Unit should be opened only with consent of plant management personnel

TABLE 8-6. INSPECTION OF NON-OPERATING REVERSE AIR (OUTSIDE-TO-INSIDE FLOW) FABRIC FILTERS

- Inspection Steps
  - Confirm that unit is out-of-service and will not be brought on-line during period of the inspection
  - Request plant personnel to open one or more access hatches on clean side of unit; evaluate quantity and pattern of clean side deposits
  - Check for obviously poorly seated bags and gaps in tube sheet welds
  - Request that plant personnel open side access hatches, if available
  - Check for bag abrasion against side flanges, internal walkways, and other bags; check for bowed and bent bag/cage assemblies
  - Check the condition of any deflector plates on the gas inlet
  - Check for obvious erosion of ductwork leading to unit

- Evaluation
  - Presence of clean side deposits (enough to make a footprint or handprint) indicates poor performance; inspection should include an evaluation of bag failure problems due to abrasion, chemical attack, ember damage, and high temperature damage; a rip test should be conducted if quantitative fabric test data is not abailable; potential for leakage around top of bag and tube sheet should also be checked
  - Potential for bag-to-bag abrasion at the bottom and for damage of the fabric against side flanges and internal walkways can be seen from side access hatches
  - Deflector plates serve to protect bags from abrasive materials; erosion of these plates could contribute to premature bag failures
  - Eroded ductwork could lead to reduced pollutant capture at the generation sources and operating temperatures below acid dewpoint in unit

- Safety Considerations
  - Hatches located on hoppers should never be opened during an inspection since there is often dangerous accumulations of hot, free flowing solids behind the door
  - Inspector should never stick his or her head into the clean air plenum since this poorly ventilated area may contain asphyxiants and/or toxic gases
  - Units serving combustion sources should never be opened up immediately after shut-down since the inrush of ambient air may cause an otherwise innocuous ember to flare into a baghouse fire
  - All hatches must be opened carefully to prevent hand injuries

- Special Notes
  - Presence of clean side deposits or other abnormal conditions cannot be used alone as a basis for a NOV
  - Unit should be opened only with consent of plant management management

TABLE 8-7. LEVEL 2 INSPECTION OF NON-OPERATING SHAKER AND REVERSE AIR (INSIDE-TO-OUTSIDE FLOW) FABRIC FILTERS

- Inspection Steps
  - Confirm that unit or individual compartment is out-of-service and will not be brought on-line during period of inspection
  - Request that plant personnel open access hatch of compartments isolated; use hatch just above the elevation of the tube sheet; evaluate quantity and pattern of clean side deposits
  - Observe bag tension throughout portion of compartment visible from access hatch; check tension of bags which can be reached without entering compartment
  - Check for leaks around thimble connections or snap ring connections
  - Check for obvious bag abrasion on internal flanges
  - Check for obvious tube sheet weld failures
  - Note any holes or tears in bags visible from access hatch

- Evaluation
  - Presence of clean side deposits (enough to make a footprint) indicates poor performance; inspection should include an evaluation of bag failure problems due to abrasion, excessive cleaning intensities, chemical attack, ember damage, and high temperature attack
  - Bag tension is critical; in both reverse air and shaker collectors bags must not sag at bottom; the reverse air bags are kept under 40 to 120 pounds tension; shaker bags are normally hung with no measureable tension
  - Spatial pattern of clean side deposits can be used to indicate dust emission problems; however, once deposits exceed several inches in depth, diagnostic signs are essentially buried
  - Gaps in tube sheet welds are usually visible since the high velocity gas stream passing through gap moves the dust deposits away from that portion of tube sheet

- Safety Considerations
  - Hatches located on hoppers should never be opened during inspection since there is often dangerous accumulations of hot, free flowing solids behind door
  - Side access hatches for each compartment should also be opened carefully since hot clean side deposits ranging from several inches to several feet in depth may be behind door
  - Under no circumstances should inspector enter compartment
  - Even compartments properly isolated may have high concentrations of toxic gases, toxic particulate and asphyxiants; the gas temperature inside can be quite hot due to radiation and conduction from adjacent compartments still operating
  - Respirators should be worn whenever observing conditions through an open hatch

- Special Notes
  - Presence of clean side deposits or other abnormal conditions cannot be used alone as a basis for a NOV
  - Unit should be opened only with consent of plant management

TABLE 8-8. LEVEL 3 INSPECTIONS OF PULSE JET FABRIC FILTERS

- Inspection Steps
  - Method 9 observation of fabric filter discharge, all process units served by fabric filter and solids discharge equipment
  - Presence or absence of visible emission spikes at regular intervals
  - Presence or absence of detached plumes
  - Counterflow evaluation of system air infiltration, starting with the fan and going backwards to the baghouse, ductwork, and hoods; note points of audible infiltration; quantify infiltration using pitot tubes on outlet, oxygen increases across collector (combustion sources only), temperature drops across unit (elevated temperature units only), and measurement of hood static pressures
  - Evaluate cleaning system frequency and compressed air pressures
  - Note points of compressed air leakage
  - Evaluate performance of diaphragm valves
  - Check for rate of solids discharge (if safely possible) and check for reentrainment of dust from solids discharge equipment
  - Measure static pressure drop across baghouse
  - Measure inlet and outlet gas temperatures
  - Review bag failure records, pressure drop data, start-up and shut-down procedures, and bag installation procedures
  - Perform rip tests on recently removed bags

- Evaluation
  - Due to comprehensive nature of Level 3 inspections, only those factors relevant to reported problem(s) should be considered
  - Evaluate by checking location and form of bag deposits; inside deposits are often caused by poor compressed air quality; outside deposits are usually caused by (1) generation of sticky material at the process source, (2) infiltration induced condensation of vaporous material, and (3) improper start-up
  - Fugitive emissions from process equipment are often due to bag blinding, poor bag cleaning, or severe air infiltration
  - Use rip test and/or diagnostic fabric test data to categorize failure mode as due to abrasion, embers, chemical attack, high temperature damage, or fabrication errors; corrective actions planned by source should address major causes of problems
  - Clean side evaluation can help determine locations and types of bag failures

- Safety Considerations
  - All safety considerations for Level 2 inspections apply
  - All portable instrumentation must be used carefully; battery-powered gauges can initiate dust and vapor cloud explosions; also, probes inside high gas velocity ducts (the majority of systems) can accumulate static charges which may lead to a dust explosion; probes must be grounded to prevent static problems
  - Avoid partially confined areas with poor natural ventilation; large positive pressure ports should not be used
  - Hot probes and hot surfaces must be treated carefully
  - Probe and other materials must never be sucked into ductwork

TABLE 8-9. LEVEL 3 INSPECTIONS OF REVERSE AIR (OUTSIDE-TO-INSIDE FLOW) FABRIC FILTERS

- Inspection Steps
  - Method 9 observations of fabric filter stack or discharge point
  - Method 9 observation of all process areas served by unit and of solids discharge system
  - Note presence or absence of detached plume
  - Counterflow inspection of air infiltration in entire gas handling system including fans, baghouse, ductwork, and hoods; evaluate infiltration in detail if audible inleakage is noticed, unit pressure drop is low, or fugitive emissions are high
  - Pitot traverses, inlet and outlet oxygen concentrations, and inlet and outlet gas temperatures are used to evaluate infiltration; oxygen and static pressure profiles for system should be prepared
  - Evaluate cleaning system frequency
  - Check for rate of solids discharge (if safely possible)
  - Measure baghouse static pressure drop and compare with baseline data
  - Measure gas inlet temperature and compare with fabric limits
  - Observe clean side conditions
  - Evaluate any bags recently removed from unit for symptoms of damage
  - Review bag failure records and maintenance records

- Evaluation
  - Due to the comprehensive nature of Level 3 inspections, only those inspection steps relevant to reported problems(s) should be conducted
  - Evaluate blinding by checking recently removed bags and by checking source of the reverse air; use of cold moisture laden ambient air in a unit running with hot vapor laden gas can lead to blinding, especially on inside surfaces of bags
  - High pressure drops are often due to poor cleaning, fabric blinding, and increased gas flows
  - Spatial pattern of clean side deposits can help to determine locations of bag holes and tears, to identify any poorly seated bags, and to locate any tube sheet weld gaps

- Safety Considerations
  - All safety considerations for Level 2 inspections apply
  - All portable instrumentation must be used carefully; battery-powered gauges can initiate dust and vapor cloud explosions; probes inside high gas velocity ducts (the majority of systems) can accumulate static charges which in turn may lead to a dust explosion
  - Avoid partially confined areas with poor natural ventilation; large ports under positive pressure should not be used
  - Hot probes and hot surfaces must be treated carefully
  - Probes and other material should never be sucked into ductwork
  - Under no circumstances should an inspector enter equipment

- Special Notes
  - All plant and union policies regarding the use of portable gauges and tools should be followed

TABLE 8-10. LEVEL 3 INSPECTIONS OF SHAKER AND REVERSE AIR (INSIDE-TO-OUTSIDE) FABRIC FILTERS

- Inspection Steps
  - Method 9 observation of fabric filter stack or individual compartment discharge points; observe pattern of visible emission variations
  - Method 9 observation of bypass ducts and process areas served by unit; observe reentrainment from solids discharge equipment
  - Note presence or absence of detached plume
  - Counterflow inspection of entire gas handling system, including fans, baghouse, ductwork, and hoods; if audible infiltration is found, static pressure drop is low, or fugitive emissions are high, infiltration should be evaluated in detail; means to quantify infiltration include pitot traverses at various points along the direction of gas flow, inlet and outlet oxygen levels, and inlet and outlet gas temperatures
  - Measure static pressure drop for collector and compare with baseline values (pressure will vary constantly)
  - Measure pressure drops across each compartment
  - Measure gas inlet temperature to unit and compare against fabric limit; measure gas outlet temperature and compare with acid and moisture dew points
  - Evaluate clean side deposits and bag tension
  - Examine recently removed bags for symptoms of blinding, abrasion, ember damage, high temperature attack, and chemical attack
  - Review bag failure records and maintenance records

- Evaluation
  - Due to the nature of Level 3 inspections, only those inspection procedures relevant to reported problems(s) should be used
  - Large majority of bag failures occur within one or two feet from bottom of bag; many of these can be identified by comparing spatial pattern of clean side deposits
  - Bag tension is critical; reverse air bags should be under noticeable tension while shaker bags are hung with no tension and no slack
  - Leaks can occur near bag bottoms if not secured properly
  - Changes in static pressure drops across compartment during cleaning indicate damper problems
  - Air infiltration is a common problem which can lead to chemical attack of bags, abrasion of bags, and fugitive emissions

- Safety Considerations
  - All safety considerations for Level 2 inspections apply
  - All battery-powered instruments must be kept out of explosive dust or vapor areas, and all probes used in ducts must be grounded
  - All poorly ventilated areas must be avoided; large diameter ports under positive pressure should not be used
  - Avoid hot ducts, hot surfaces, and hot probes
  - Under no circumstances should inspector enter equipment

- Special Notes
  - All tools and instruments must be used in accordance with plant and union policies

TABLE 8-11. LEVEL 4 INSPECTIONS OF FABRIC FILTER SYSTEMS

- Inspection Steps
  - Prepare flow charts for both process equipment and fabric filter; show all major components for unit are shown such as compressed air source, compressed air drier, solids discharge valve, and baghouse instrumentation
  - Check conformance of system to construction and/or operating permit
  - Perform inspection steps as presented for Level 3

- Evaluation
  - Compile baseline data; send a copy to source operator
  - Check flow charts for accuracy through discussions with plant personnel
  - Evaluate procedures for disposal of collected material to ensure all water and solids waste requirements will be satisfied
  - Discuss start-up procedures and other operational procedures
  - If measurement ports were not available in necessary locations or available ports were not appropriate size, the desired locations should be specified

- Safety Considerations
  - All safety considerations applicable to Level 2 and 3 inspections are applicable
  - Source operator should not be asked to put in measurement ports until equipment is down and can be properly prepared for cutting or welding operations

- Special Notes
  - Plant management should be advised that compilation of baseline data is simply to aid inspector (and plant operations personnel) and is not intended to represent operational restraints or other limits on manner in which equipment is operated
  - Inspector should never use baseline data to interfere with the operator's prerogatives in running facility; data are used strictly to determine (1) if there is a probable compliance problem which justifies a reference method test, and (2) if proposed corrective actions to be taken by plant in response to a problem have a reasonable chance to succeed
  - Confidential data should be taken only if absolutely necessary

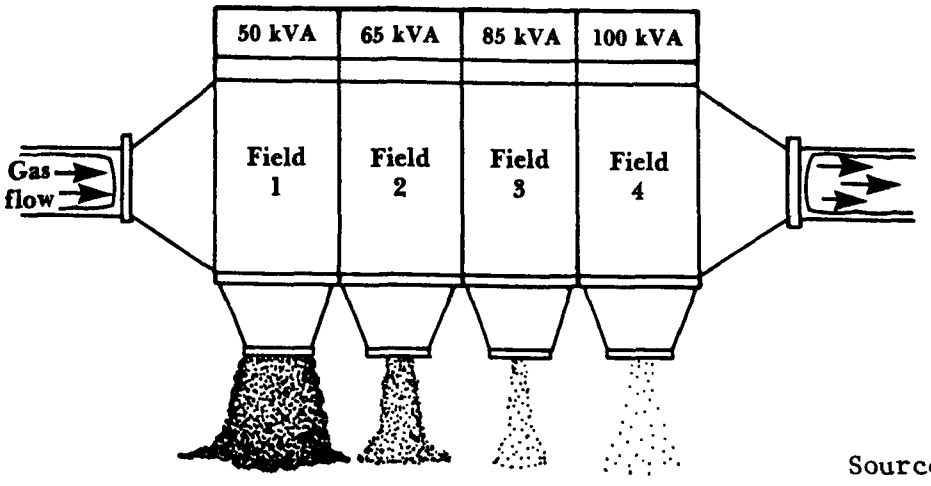
8.5 INSPECTION OF ELECTROSTATIC PRECIPITATORS

These inspections start with a careful evaluation of the visible emissions and an evaluation of the electrical operating conditions. The remainder of the inspection focuses on potential problems identified by the shifts in this data. The Counterflow approach is the most appropriate methodology for electrostatic precipitator inspection.

8.5.1 Descriptions of Major Types of Electrostatic Precipitators

Electrostatic precipitators consist of a large array of small discharge electodes suspended between large collection plates. A high voltage is applied to the discharge electrodes. The collection plates are grounded along with the hoppers and shell. Alignment of the discharge electrodes and the collection plates is critical to the proper operation of the unit. Operating problems and installation errors can contribute to poor alignment.

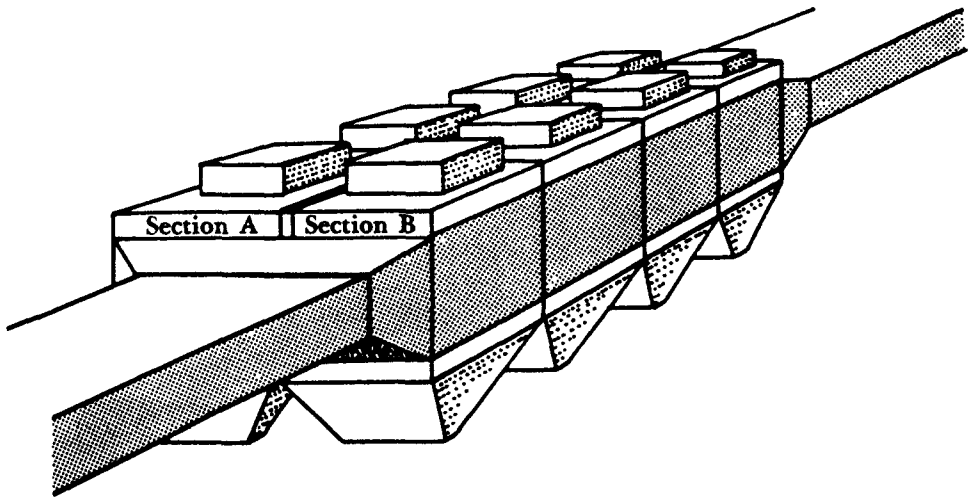
The discharge electrodes are arranged in fields, each powered by its own transformer-rectifier set (often termed a T-R set). There are normally a number of these in series along the gas flow path as shown in Figure 8-7. There is a solid partition between the chambers to prevent gas flow from on chamber to another.



Source: APTI

Figure 8-7. Fields in Series.

The sectionalization illustrated in the previous two figures allows operation at optimum electrical conditions and isolates possible internal problems to one T-R set without affecting the performance of the other power supplies.

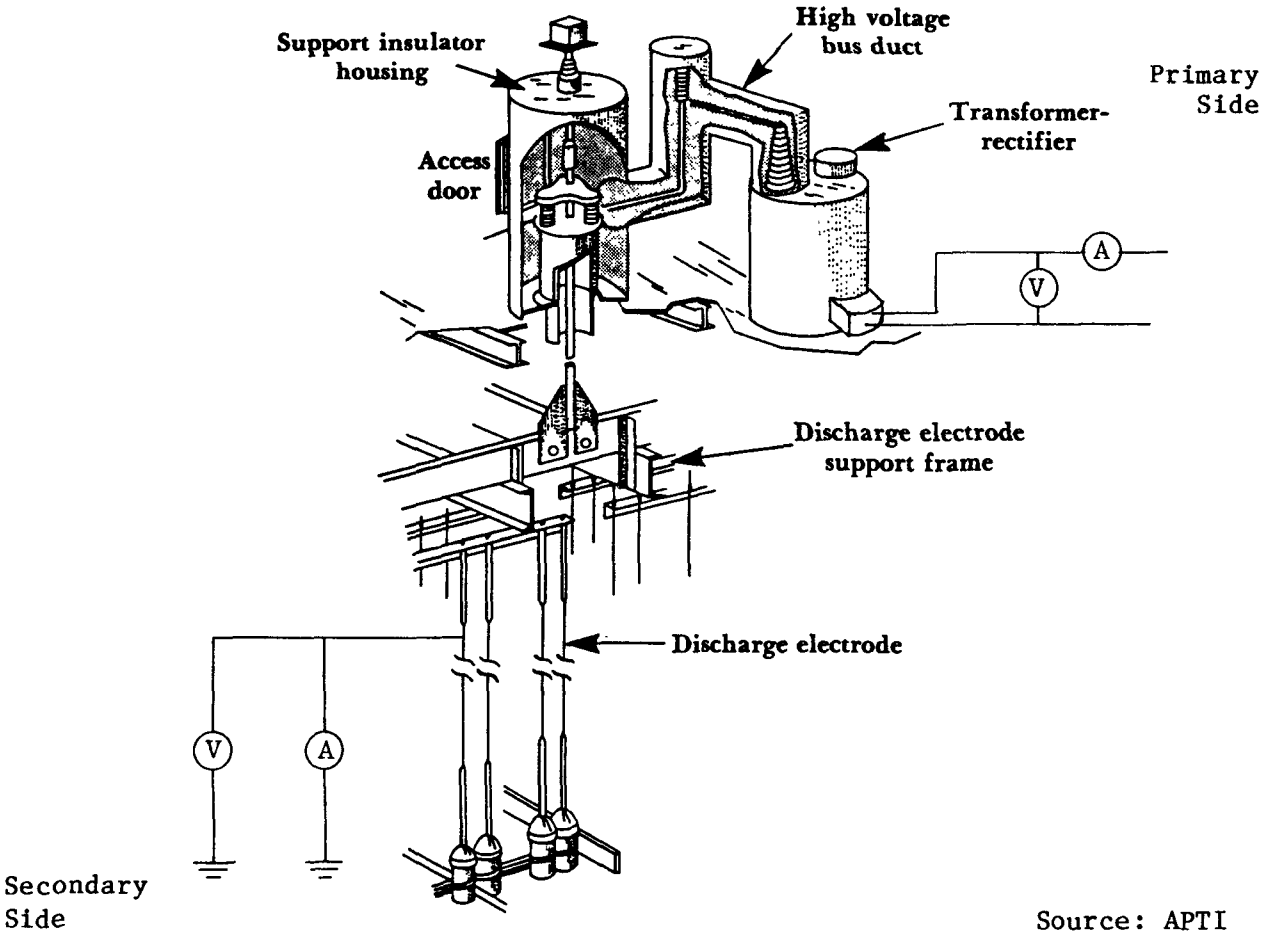


Source: APTI

Figure 8-8. Chambers of a Precipitator.

Each power supply energizes the discharge electrode frame within the field. The electrical conditions within the power supply and within the field itself are monitored by gauges on the control cabinet for that T-R set. The commonly monitored electrical conditions include primary current, primary voltage, secondary current, secondary voltage, and spark rate. Many of the older units do not monitor the secondary voltage and some of the newer systems do not include a spark rate gauge. The meanings of the parameters are illustrated in Figure 8-9.

As shown in the Figure 8-9, the primary current and primary voltages are the conditions of the inlet alternating current power line to the transformer-rectifier set. Since this line is connected to the primary side of the transformer, it is called the primary line. The secondary voltage is the voltage of the entire discharge electrode frame and the discharge electrodes. The current which passes from the discharge frame and electrodes to the grounded portions of the precipitator are termed the secondary current. Again the term "secondary" derives from the position on the secondary side of the transformer. The spark rate is simply the number of sparks per minute which pass from the discharge electrodes (or frame and high voltage line) to the grounded portions of the unit. The circuit leading from the transformer-rectifier set inside to the discharge electrodes over to the collection plates and ultimately to ground is direct current. The performance of the precipitator can be evaluated by comparing the secondary currents, secondary voltages, and spark rates against baseline values. If the unit does not have secondary voltage meters, similar analyses can be done using the primary currents, primary voltages, secondary currents, and spark rates. To perform meaningful reviews the data from all fields of the precipitator must be obtained and analyzed.



Source: APTI

Figure 8-9. Field Electrical Conditions.

The precipitator should operate at the maximum possible secondary voltages (and primary voltages). The factors which determine the actual voltages in each of the fields includes the transformer-rectifier design, the internal physical dimensions, internal faults, the dust resistivities, and the characteristics of the gas stream. While some variability of operating voltages is inevitable, major decreases in the voltages are a clear symptom of operating problems. The secondary current data and the spark rate data are useful in identifying the general category of problem(s) which may exist.

One important operating variable which cannot be measured is the resistivity of the dust layer on the collection plate. The resistivity can alter the electrical operating conditions of a field and also can affect the amount of material released as a puff during rapping of the collection plates. In precipitators operating at relatively low gas temperatures, the resistivity is a strong function of the gas temperature with changes of 10°F to 30°F sufficient to modify the unit's overall particulate removal efficiency. Units operating at high temperature are less sensitive to gas temperature. While it is not possible for an inspector to determine the resistivities prevailing during the inspection, it is possible to identify the general range of resistivity as low, moderate, or high. This is done by observing the field

by field changes in voltages, currents, and spark rates. Other data used include gas temperatures, fuel sulfur content (if applicable), conditioning system operating conditions (if applicable), particle composition analyses, and rapping reentrainment spike timing. All of this data must be evaluated together to evaluate the extent to which the overall resistivity is varying and to determine the extent to which resistivity varies throughout the precipitator.

If the resistivity for a given chamber is in the moderate or high range, the power input to the chamber is a useful indirect index of the particulate removal efficiency. This can be calculated by multipying the secondary current times the secondary voltage for each field and summing across the chamber. If secondary voltage data is not available, the power input can be approximated by multiplying the primary voltage times the primary current times an adjustment factor between 0.60 and 0.80. If the power input for a single chamber or a number of chambers has dropped substantially relative to the baseline values, the particulate removal efficiency has probably decreased.

The gas velocity through the precipitator is also an important variable which cannot be measured directly. An increase in the velocity decreases the time available for some of the small particles to pass across the space between the discharge electrodes and collection plates. Gas velocity increases also result in more reentrainment of particles during rapping of the discharge electrodes and collection plates. Since it is impractical to conduct a pitot traverse of the large ducts during an inspection, the gas flow rate must be indirectly evaluated using process related factors.

Variations in the local gas velocites throughout the inlet to the precipitator affect the particulate removal efficiency; however, there is no simple way to identify gas flow differences. This problem can only be identified by special field testing and scale model flow tests.

The rapping of collection plates and discharge electrodes must be done at the correct intensity to remove the proper amount of material without causing a large intermittant puff of solids out of the unit. The optimum rapping intensity is a function of the dust resistivity. Therefore, it varies on a regular basis. The operation of the rapping system is checked by examining the transmissometer strip chart for possible rapping spikes, by checking for obvious puffing at the stack exit, and by checking the intensity of the rapping systems. The inspection may include a check of the rapper systems to confirm that all or most of the rappers are operational.

Most electrostatic precipitators operate at static pressures ranging from -10 inches of water to -25 inches of water. At these pressures, air infiltration is very possible and this could lead to a number of serious conditions. Air infiltration is evaluated using the process oxygen monitor and the stack oxygen monitors. Points of audible air infiltration around hoppers, solid discharge valves, access hatches, expansion joints, and other spaces should be noted. When the oxygen monitors are not available, the inspection is limited to audible checks and this is not a very complete survey since it is difficult to safely approach many of the common sites of infiltration.

In addition to checking the precipitator performance, it is often necessary to evaluate any process related conditions which could conceivably affect the overall particulate removal effectiveness. Any factors which affect the particle size distribution, compositon of fine particles, concentration of sulfur trioxide, concentration of water vapor, and gas flow rate should be evaluated. Such evaluations are difficult and time consuming. Therefore, these are only performed in response to a chronic and significant excess emission condition.

8.5.2 Level 1 Inspections of Electrostatic Precipitators

The Level 1 inspection of large electrostatic precipitator systems consists primarily of a careful and complete evaluation of the stack effluent gas characteristics. This can be done at the plant boundry without the need to enter the facility. Since the stacks are often high, the location for the observation should be chosen to minimize the elevation angle. For the very small positive corona precipitators, the stack is generally too low to be seen from the plant boundry. In this case, it is necessary to perform the inspection on the plant grounds.

The visible emissions should be observed using Method 9 procedures. For the few cases it which there is a condensed water droplet plume, the observations should be made at the point of maximum opacity either before or after the "steam" plume. The dispersion characteristics of steam vents should be noted in the inspection notes in addition to the notes concerning the plume from the precipitator. The average opacity should be compared with the regulatory limit and against the baseline values. A significant increase in the average opacity is of concern even if the regulatory limit is not yet exceeded. The magnitudes of intermittant spikes should also be recorded.

Any detached plume or condensing/reacting plume characteristics should be carefully described in the notes. With plumes of these types, at least part of the liqht scattering material is due to vapors which pass through the precipitator before condensing. Process related factors are responsible for these conditions.

While conducting the Level 1 inspection, the presence of large settleable particulate in the general vicinity of the stack, often termed "snowing", should be noted. Under cold conditions, this can actually be snow flakes formed by the condensation and freezing of small water droplets in the plume. Solid particulate "snowing" has also been observed at certain types of plants under all weather conditions. In these cases, it appears to be due to various precipitator and stack related problems.

Fugitive emissions from the precipitator solids discharge system, fuel and raw material stockpiles, and other plant sources should be observed. It is generally necessary to make such observations at a point or points different than that used for the stack observation.

If any of the observations indicate that the visible emissions are above regulatory limits or that fugitive emissions are in violation of applicable regulations, the data should be provided to the plant management as soon as possible. This is necessary to satisfy Due Process requirements. A summary of the Level 1 inspection steps are provided in Table 8-12.

8.5.3 Level 2 Inspections of Electrostatic Precipitators

The Level 2 inspection includes the steps outlined in Table 8-13 plus an evaluation of the transmissometer data and an evaluation of the electrical conditions in each field. The analysis of the data gained during a Level 2 inspection can be used to address the following questions:

- Are the visible emissions above the regulatory limit?
- Are there significant fugitive emissions as defined by the applicable regulations?
- Do the visible emissions data and electrical data baseline evaluations indicate a possible mass emission compliance problem on either a continuous or intermittant basis?
- Are all the necessary records being maintained?

Based on the results of the Level 2 inspection, it is possible to determine if follow-up evaluation of either the precipitator and/or the process equipment is necessary. These additional efforts should focus on only those factors considered relevant to the potential problems identified.

It is often necessary to make the visible emission observations from a location similar to that used for the Level 1 inspections. Due to the tall stacks, the elevation angle might be too great from a position inside the plant grounds. The Method 9 observation should be made before the data from the transmissometer has been reviewed.

If it is possible to safely and conveniently reach the transmissometer, the monitor should be checked before reviewing any of the strip chart data. It should be confirmed that the unit purge air blowers are working and that the unit is mounted correctly on the stack or breeching. If the unit includes provisions for quickly checking the alignment, this should also be done.

The transmissometer zero and span should be checked by plant personnel during the evaluation of the strip chart data. Any indicator lights denoting "dirty" windows or other operational problems should be noted in the inspection report. If the both the physical evaluation of the transmissometer and the operational evaluation done at the console indicate that the unit is working properly, the monitoring data should be reviewed. Short and long term shifts in the average opacity should be carefully analyzed by reviewing data from the previous 12 to 24 hours. The timing, duration, and pattern of any spikes should be analyzed to the extent possible. It should be noted that these spikes can be due to several unrelated precipitator and process related conditions, thereby making any analysis difficult. Nevertheless, it is useful to determine if there are any regular or repeating patterns to these spikes to

facilitate latter portions of the inspection. The average opacity should be calculated from the transmissometer strip chart. With highly varying conditions, it may be necessary to graphically integrate the data and this is best done following the inspection. A simple "eye ball" estimate can be used as an interim value until this calculation is completed.

The next step in the Level 2 inspection is the evaluation of the field-by-field electrical data available on the control cabinet gauges. It is important that this data be recorded starting with the inlet field and proceeding backward through the chamber. The field designations must be known before recording the data since the control cabinets in the substation are rarely arranged in the same order as the fields on the precipitator. The data to be recorded is listed below:

- Secondary Voltage
- Secondary Current
- Spark Rate
- Primary Voltage
- Primary Current
- Automatic Voltage Controller Status Light

If a spark rate meter is not available or appears to not be working correctly, the spark rate can be estimated by counting the fluctuations of the primary or secondary voltage meter for a period of 1 to 2 minutes. The accuracy of the secondary voltage and secondary current meters is checked by comparison with the primary voltage and current meters. There is a proportionality between the primary side and secondary side data. With this comparison it is possible to identify seriously malfunctioning gauges.

The secondary voltage, secondary current and spark rate data for each chamber should be plotted starting with the inlet field and proceeding to the outlet field. The baseline data should have previously been plotted on the same graph. Shifts from baseline conditions which affect every field in a chamber are generally caused by factors controlled by process equipment. This includes changes in the fuel sulfur content, the dust composition, the gas stream humidity, the flue gas conditioning equipment, and the inlet particle size distribution. Most of these affect the particulate resistivity. Conditions which affect only one field or several fields are normally caused by physical problems within the precipitator itself. In most cases these physical problems cause a drop in the secondary voltage, a slight increase in the secondary currents, and an increase in the sparking rates.

The field-by-field plots should be analyzed to determine if the dust resistivities are in the low, moderate, or high range. Data concerning fuel sulfur contents, gas temperatures, and conditioning system operation can be used as supplementary information in assessing resistivities. If the resistivities are in the moderate or high range, the power input for each chamber can be used as a general indicator of precipitator performance. A significant decrease in the power input to any one chamber warrants a Level 3 inspection. Also if the field-by-field voltage plots indicate a significant drop in all of the voltage levels, then a Level 3 inspection is warranted.

If the visible emission data and the electrical data both indicate that there have been no significant changes since the baseline period (when the unit was known to be in compliance), the inspection should be terminated. However, if either the visible emissions data or the electrical data indicate operating problems, further review is recommended. The Level 2 inspection is limited to a review of previous transmissometer strip charts and precipitator logs (electrical set data) to confirm that the data obtained is representative of typical conditions. Basic data concerning the process operation such as fuel quality, load, and operating temperatures should be obtained. Follow-up analysis of the problems identified, however, falls within the scope of a Level 3 inspection. This can be conducted immediately if the inspector is qualified. Otherwise, the inspector must wait until a senior agency engineer experienced with precipitators is available.

8.5.4 Level 3 Inspections of Electrostatic Precipitators

The purpose of the Level 3 inspection of electrostatic precipitators is for the inspector to determine: (1) if the operators recognize that a problem exists and (2) if the operators proposed corrective actions have a reasonable chance of success. This is done only as a follow-up to a Level 2 inspection.

The starting point for the Level 3 inspection is the evaluation of the visible emissions data and the electrical data obtained during the Level 2 inspection. If some time has passed since the Level 2 inspection, this data should also be obtained for the present period.

A co-current inspection of the process should be conducted whenever there are symptoms of high or low resistivity in one or more chambers of the precipitator. The areas of interest include: (1) the fuel sulfur content variability, (2) the gas temperatures at the inlet to the precipitator, (3) the particle composition, and (4) the performance of any flue gas conditioning equipment or additives. Rapping intensities on the precipitator should also be checked since it is often more difficult to rap effectively when the resistivity is high.

Factors which potentially cause resistivity variations should be evaluated whenever the power inputs to the various chambers are significantly different. A partial list of the potential causes include: (1) poor gas distribution, (2) air preheater induced gas and temperature maldistribution, and (3) air infiltration.

Whenever there is a decrease in the voltage to a field coupled with increases in the currents and spark rates, physical conditions within the field should be evaluated to the extent possible. Some of the potential conditions include: (1) misalignment of the discharge electrodes and/or collection plates, (2) solids overflow of hoppers, (3) discharge electrode failure or sway, (4) high resistance shorts across insulators or support beams, (5) air infiltration, and (6) clearance problems. A useful starting point for the evaluation of these conditions is a review of the air-load curves obtained during the previous start-up and the air-load curves obtained during the baseline period. A walk around check for audible air infiltration should be made in the hopper areas, near access hatches, adjacent to expansion joints, and on the precipitator roof. The oxygen monitors located after the

process equipment and in the stack should be checked to determine the rise in oxygen levels across the precipitator.

The wire failure records should be reviewed if a number of fields have been out of service during the preceeding months. Wires which have been discarded on the roof of the precipitator should be examined to find the location of the failure and the general type of break. Plant personnel should be asked about any special tests which have been performed to confirm the type of damage.

If one or more fields have suppressed currents, the operation of the collection plate and discharge electrodes should be checked. The rapper operation is visually observed for part of the rapping cycle. Out-of-service rappers should be noted.

If there have been frequent field outages due to hopper overflow, the operating conditions of the solids discharge system should be checked. The status of hopper heaters and vibrators can be confirmed at the control cabinet. The presence or absence of hopper insulation and wind shields should be noted. The Level 3 inspection steps for electrostatic precipitators are summarized in Table 8-14.

8.5.5 Level 4 Inspections of Electrostatic Precipitators

The most favorable opportunity for a Level 4 inspection of electrostatic precipitators is during a Method 5 or Method 17 stack test. This inspection should be performed by a senior agency engineer who is experienced with the inspection and evaluation of electrostatic precipitators. This individual should not be assigned any duties for the observation of the stack test team since this will distract from the effort necessary to obtain the baseline information.

The scope of a Level 4 inspection is similar to the Level 3 inspection with the exception that all of the listed activities in Table 8-15 will be performed. In a Level 3 inspection, only those relevant to a suspected performance problem are investigated.

In addition to gathering the data and related information, the inspector should prepare several sketches. The layout of fields and chambers in the precipitator should be illustrated. The designations used by the plant should be clearly shown on this sketch. Another sketch should show a simplified drawing of the solids discharge system and include information on hopper heaters and hopper vibrators. A sketch should be prepared showing the locations of all collection plate, discharge electrode, and gas distribution screen rappers. The control cabinet for each set of rappers should be marked. A sketch should sketch should illustrate the flue gas conditioning system and the location of the injection points. A brief description of the important operating variables for this system should be noted on the drawing or on some attached notes.

The inspector should also prepare some brief notes concerning the operation of the process equipment with emphasis on the variables which will be of most interest with respect to potential air pollution control problems. The types of data to be taken and observations to be made during a routine Level 2 inspection should be listed. The start-up procedures for the unit should also be described.

TABLE 8-12. LEVEL 1 INSPECTIONS OF ELECTROSTATIC PRECIPITATORS

- Inspection Data and Observations
  - Method 9 observation of the stack for a period not less than 6 minutes; average opacity should be calculated and compared with regulatory limit and baseline values
  - Method 9 observation of fugitive emissions from precipitator solids discharge equipment, stockpiles, and other sources
  - Magnitudes of intermittant emission spikes
  - Presence or absence of detached plume
  - Presence of absence of condensing or reactive plumes
  - Presence of large settleable dust from plume
  - Weather conditions should be fully described
  - Note plume color and plume dimensions relative to typical conditions (i.e. small, typical, large)

- Evaluation
  - If average opacity has increased by 5% since baseline period, or if the average opacity is within 5% of regulatory limit, a Level 2 inspection is indicated
  - Presence of a detached plume, a condensing plume, and/or a reacting plume suggests that vapors and/or gases are passing through precipitator and then undergoing physiochemical changes to produce light scattering material; a co-current inspection of process is warranted
  - There should be no significant fugitive emissions from precipitator solids discharge system, stockpiles, haul roads, or other sources; note localized wind conditions near source of fugitive emissions
  - A general assessment of the gas flow should be noted; this is done by observing magnitude of plume in a area not affected by condensed water droplets; this helps distinguish normal emissions from off-line emissions due to equipment maintenance
  - Plume color is useful for identifying condensing/reactive plumes

- Safety Considerations
  - Location(s) selected for observations should be protected from moving vehicles (cars, trains, heavy equipment) and should provide secure footing; coal and material stockpiles are not suitable
  - ESP's pose a potential electrical hazard due to the high voltages involved in their operation and their associated electrical components such as rappers and vibrators

- Special Notes
  - Avoid trespassing on private property to reach a good location for observations (unless public access is allowed)
  - If plant entry is necessary to observe equipment, normal procedures are applicable
  - If observations will probably form the basis for a NOV, results should be provided to source as soon as possible
  - Elevation angle correction may be necessary to compare stack opacity observations to baseline data period if observations are made at different distances from the stack; however, it is not required by Method 9

TABLE 8-13. LEVEL 2 INSPECTIONS OF ELECTROSTATIC PRECIPITATORS

- Inspection Steps
  - Method 9 observation of stack discharge
  - Timing, duration and pattern of intermittant puffs
  - Characteristics of any detached, condensing or reactive plumes
  - Physical conditions of transmissometer transmitter and retroreflector
  - Transmissometer zero and span values, status of window lights
  - Transmissometer strip chart data
  - Precipitator electrical set data, including plots of the secondary voltages, secondary currents, and spark rates for each chamber starting with the inlet field and proceeding to the outlet field
  - Process operating data
  - Transmissometer strip chart records and electrical set records

- Evaluation
  - Increase of > 5% opacity in visible emissions since baseline period or visible emissions within 5% opacity of the regulatory limit warrant a Level 3 inspection
  - If data indicates unit is operating in moderate or high resistivity conditions, power input should be computed and compared against baseline values
  - Compare the secondary (or primary) voltages with the baseline values
  - Compare the field-by-field electrical data plots with baseline values
  - Analyze transmissometer strip charts for characteristic patterns of operating problems

- Safety Considerations
  - ESP's pose a potential electrical hazard due to the high voltages involved in their operation and their associated electrical components such as rappers and vibrators
  - Inspectors should be trained in safety procedures prior to using stack elevators to reach transmissometers mounted on stacks
  - Check all ladders and platforms before use; safe ladder climbing practices are necessary
  - Avoid poorly ventilated areas around expansion joints, flanges, and other areas

- Special Notes
  - Power input calculations and electrical set analyses provide only a general indication of performance this data cannot be used in lieu of standard stack sampling procedures to document a violation of mass emission regulations
  - Elevation angle correction is necessary to compare stack opacity observations to baseline data; however, it is not required for Method 9

TABLE 8-14. LEVEL 3 INSPECTIONS OF ELECTROSTATIC PRECIPITATORS

- Inspection Steps
  - All inspection steps listed for Level 2 inspections are included within scope of Level 3 inspection; if Level 3 inspection is being done on a different day, then repeat original Level 2 steps
  - Check for audible air infiltration at access hatches, expansion joints, flanges, and hopper area; check for increases in oxygen levels across precipitator using permanently mounted plant monitors
  - Check rapper intensities, operating status, and sequence
  - Check hopper heater status, hopper vibrator operating status, and for presence or absence of insulation and wind protection
  - Analyze air-load curves for symptoms of misalignment, clearance problems, and high resistance shorts
  - Check gas distribution screen rappers
  - Check operation of flue gas conditioning system

- Evaluation
  - Perform a co-current inspection of the process if there is a detached condensing or reactive plume; check fuel quality data, operating temperatures, and other process operating conditions
  - A co-current inspection of the process should be conducted if the following symptoms of high resistivity are observed in all or most fields of a chamber: increases in the average opacity/decreases in voltages, or decreases in secondary currents/increases in sparking
  - A co-current inspection of the process should be conducted if the following symptoms of low resistivity are observed in all or most fields of a chamber: increases in average opacity, increases in intermittant spikes, drops in voltages, increases in the secondary currents, and decreases in the spark rates
  - Evaluate factors which cause resistivity variations when there are significant differences in the power input levels to each chamber
  - Physical problems which are normally isolated to single fields should be evaluated when the following symptoms are observed: an increase in average opacity, a decrease in voltage of a single field, increase in current of same field, and an increase in spark rates of field
  - Check rapper operation if currents have decreased
  - Check rapper intensity if there are regularly occurring spikes

- Safety Considerations
  - ESP's pose a potential electrical hazard due to the high voltages involved in their operation and their associated electrical components such as rappers and vibrators
  - Under no circumstances should the inspector enter a precipitator even though it has been deenergized, locked out, and purged; no attempt should be made to observe conditions from an open hatch
  - Avoid contact with hot ducts and precipitator components
  - Avoid poorly ventilated areas

- Special Notes
  - Level 3 inspection results help negotiate corrective actions and/or compliance with the source management; they do not provide direct evidence of noncompliance with mass emission regulations

TABLE 8-15. LEVEL 4 INSPECTION OF ELECTROSTATIC PRECIPITATORS

- Inspection Steps
  - Scope of the inspection is identical to that for Level 3 inspections
  - Prepare sketches of layout of fields and chambers, locations of all rappers, solids discharge system, and any flue gas conditioning system
  - Check conformance of the system to construction and/or operating permit requirements
  - Prepare a brief discussion of process operating variables for field inspectors who will have responsibility for this plant
  - Summarize electrostatic precipitator start-up procedures

- Evaluation
  - Compile baseline data; copy may be sent to source management
  - Evaluate procedures for the disposal of the collected material to ensure that all applicable water and solid waste requirements are satisfied
  - Discuss start-up procedures and precipitator recordkeeping procedures with the plant management

- Safety Considerations
  - All safety considerations applicable to Level 2 and Level 3 inspections should be satisfied

- Special Notes
  - Advise plant management that the compilation of baseline data is simply to aid the inspector (and perhaps plant operations personnel) and is not intended to represent operational restraints
  - Never use the baseline data to interfere with the operator's perogatives in running the facility; the data is used strictly to determine: (1) if there is probable compliance problems, and (2) if proposed corrective actions to be taken by a plant in response to a problem have a reasonable chance of succeeding
  - Confidential data should be taken only if absolutely necessary

8.6 INSPECTION OF PARTICULATE WET SCRUBBERS

Particulate wet scrubber inspection procedures based on the Baseline Technique are presented in this section. Commercially available units have been divided into four separate categories based on the specific inspection steps necessary to evaluate their performance. Data and observations which are useful for evaluating performance are listed for each of the four levels of inspection. While this section presents listings of the normal inspection steps, these cannot serve as a substitute for a full understanding of wet scrubber operating principles and inspection techniques. Technical information concerning wet scrubber systems are presented in References 7, 8, and 9.

8.6.1 Descriptions of Major Types of Particulate Wet Scrubbers

The four major categories of particulate wet scrubbers discussed in this section include: (1) spray tower scrubbers; (2) packed bed, moving bed, and tray-type scrubbers; (3) mechanically aided scrubbers; and (4) gas-atomized scrubbers. The following section describes the general configuration of the scrubber, the common components of the scrubber system, and the important operating parameters.

8.6.1.1 Spray Tower Scrubbers - The spray tower scrubber is the simplest type of scrubber used for removal of particulate matter. It is a vertical tower with one or more sets of spray nozzles. The gas stream can pass directly up the tower as shown in Figure 8-10a or the unit can be designed with a cyclonic flow section near to the bottom as shown in Figure 8-10b.

Typical gas velocities range from 2 to 4 feet per second. The static pressure drop across the unit is generally quite small. Demisters are used in the top of the scrubber vessel to reduce the quantity of water droplets emitted from the scrubber. The two most common types of demisters for this type of scrubber are the chevron and mesh pad demisters.

This type of scrubber is often difficult to evaluate due to the lack of instrumentation and the poor accessibility to the demister and spray nozzle header areas. The system being inspected may not have inlet gas temperature recorders, liquor pH recorders, recirculation liquor flow rate indicators, pump discharge pressure gauges, and nozzle header discharge pressure gauges.

The factors which govern performance of these scrubbers are the types and orientation of the spray nozzles, the physical condition of the spray nozzles, the liquid-to-gas ratio, and the particle size distribution. The latter is most important since the spray tower scrubber has only limited capability for the removal of small particles. Nozzle erosion and pluggage can be problems due to the characteristics of the recirculation liquor and the often difficult accessibility to the nozzles.

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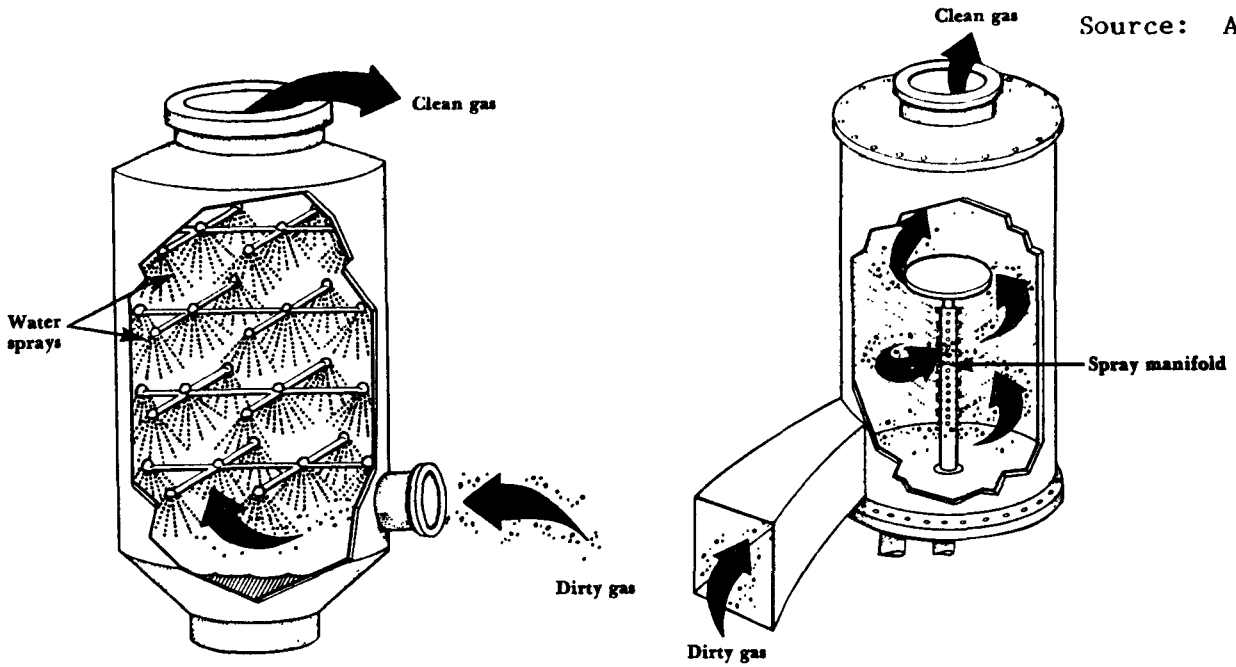


a. Simple Spray Tower b. Cyclone Spray Tower

Figure 8-10. Spray Tower Scrubbers.

8.6.1.2 Packed Bed, Moving Bed, and Tray-Type Scrubbers - This category includes a very large variety of commercial designs. The scrubber is always a vertical cylinder; However, the method of gas-liquid contact differs.

Figure 8-11 is sketch of a packed tower scrubber. The gas stream enters from the bottom and passes upward through one or more beds of solid packing material. The liquor is distributed on the top of the first bed by spray nozzles and the liquor passes downward over the surface of the packing. The primary function of the packing is to maximize the amount of surface area available for absorption of gases and vapors.

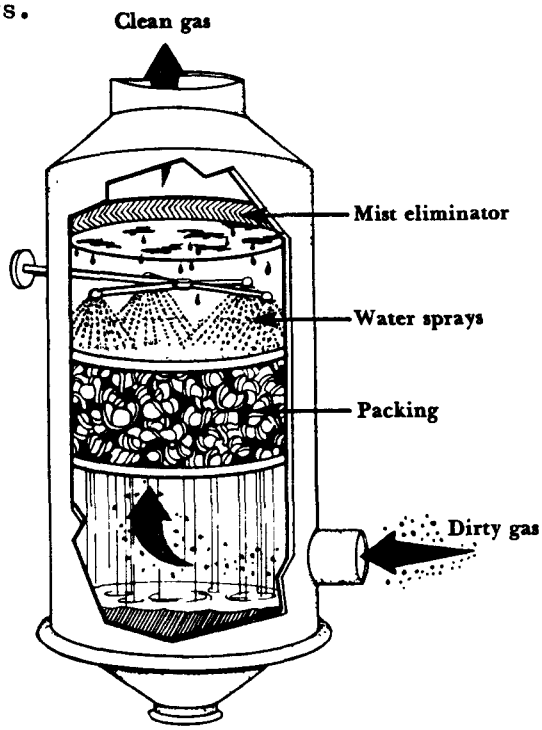


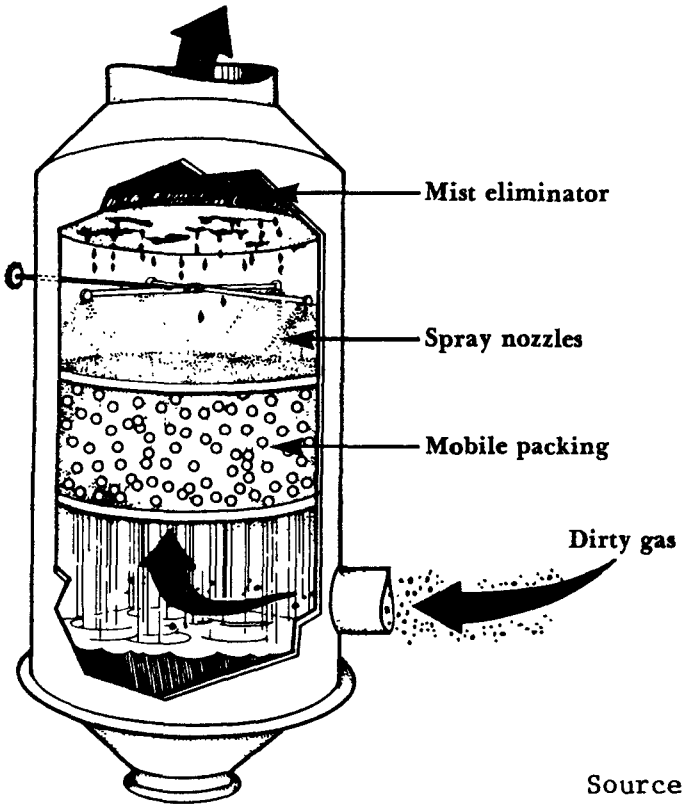
Figure 8-11. Packed Bed Scrubber.

The packed tower scrubber has only limited capability for particulate control since the velocities are low as the gas stream passes up through the open areas of the packing. Also, the low liquor velocities down the packing only weakly remove deposited solids. Therefore, the scrubber is not appropriate for sources with high solids loadings in the gas stream. Despite these limits, the scrubbers have been used successfully for the removal of particulate matter on some sources.

The most important operating variables are the gas velocity up through the bed and the degree of gas-liquid maldistribution, termed channeling, which has occurred.

A moving bed scrubber is shown in Figure 8-12. Most commercial units have several of the beds in series rather than the single stage shown in this figure. The gas stream enters from the bottom and passes up the scrubber vessel counterflow to the liquor. The spray nozzles at the top of the unit are intended to provide good gas-liquid distribution. The beds are only partially full of hollow spheres which move in a highly turbulent manner. The water droplets and water sheets which form due to the motion of the balls provide targets for impaction of particles. This style of scrubber can also be used for the removal of gases.

This scrubber is well-suited for sources of sticky material or sources with high solids loadings since there are no restricted passages which can plug. The turbulent action of the spheres also has a self-cleaning effect.

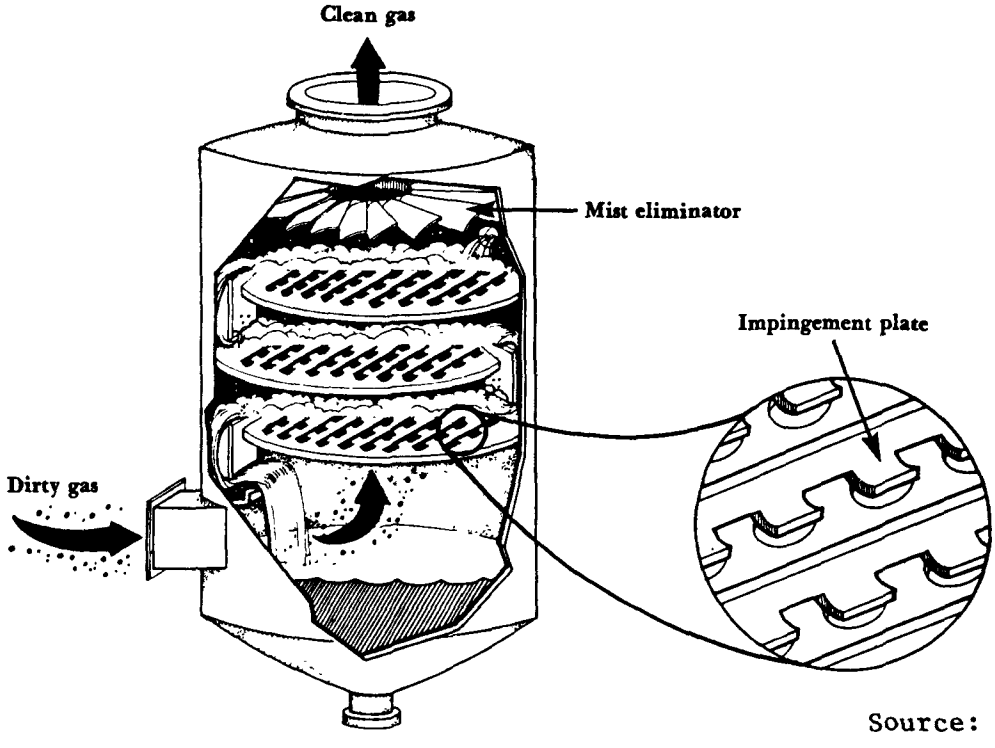


Source: APTI

Figure 8-12. Moving Bed Scrubber

The most important factors controlling the performance of the moving bed scrubber include the pressure drop across the scrubber, the liquor-to-gas ratio, the degree of gas-liquor maldistribution, and the particle size distribution. There are often measurement ports before and after each stage. The degree of instrumentation used is a function of the size of scrubber and the type of application.

In the tray scrubbers, the gas stream enters near the bottom of the scrubber vessel and passes upward through a series of horizontal trays. Holes in the trays allow the gas to pass through the trays to contact a layer of water on each of the trays. Particles impact on the atomized water droplets formed by the high velocity gas streams leaving each of the holes. The liquor is introduced at the top and flows across each of the trays in sequence. Down-comers are used to move the liquor from one tray to the next. A sketch of a tray tower scrubber is shown in Figure 8-13. An impingement tray is used in this sketch. Other common tray designs include a flexible cap and a sieve plate.

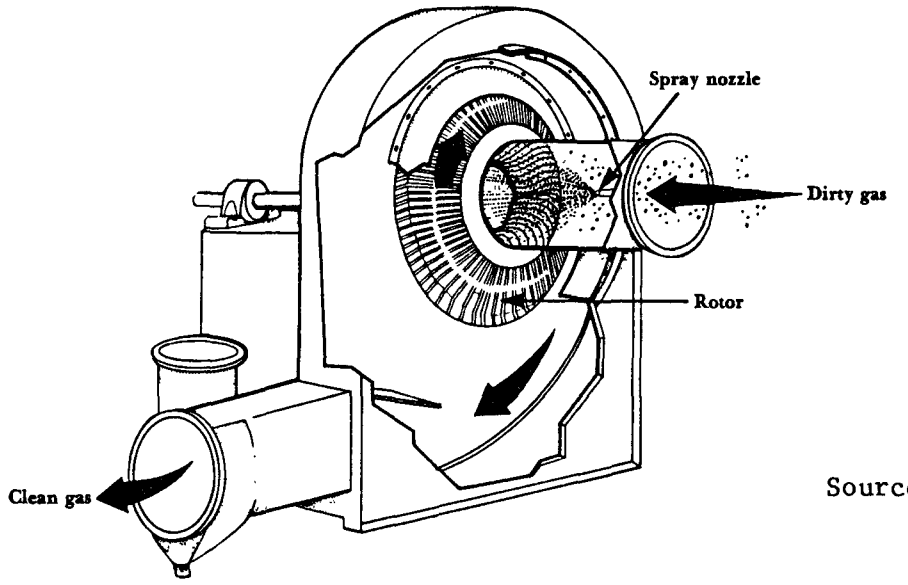


Source: APTI

Figure 8-13. Tray Tower Scrubber.

This basic scrubber design has the capability for moderate to high efficiency particulate removal. Variables which control the scrubber performance include the liquor flow rate, the degee of gas-liquor maldistribution, static pressure drop, and the liquor suspended solids content. Liquor pH is important with respect to corrosion. It is possible that the surface tension of the liquor also has some impact on the overall particulate removal efficiency.

8.6.1.3 Mechanically Aided Particulate Wet Scrubbers - The most common type of mechanically aided scrubber is similar to a fan equipped with water sprays as shown in Figure 8-14. The unit can serve as both a particulate control device and as the main gas mover for the system being controlled. As with any fan, there is a static pressure increase rather than a "pressure drop."



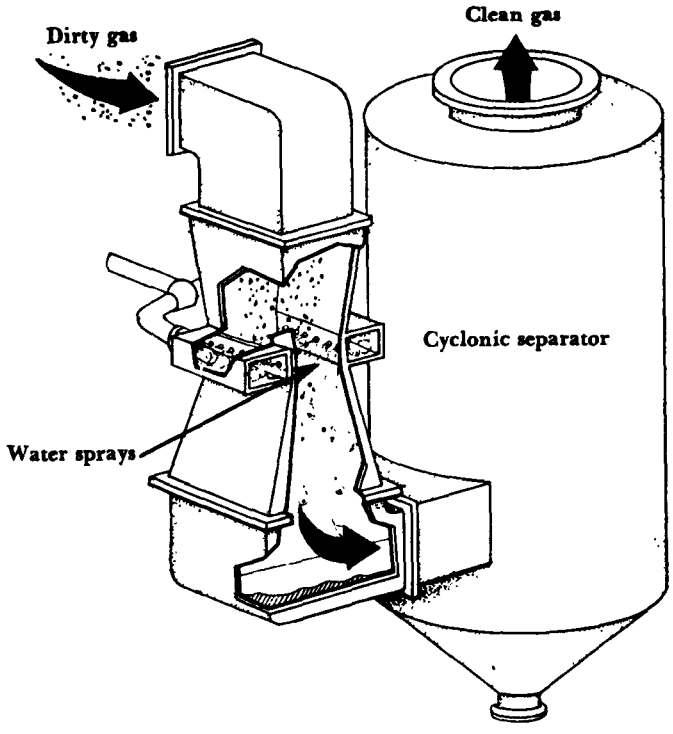
Source: APTI

Figure 8-14. Mechanically Aided Scrubber.

This type of scrubber is normally small. The important scrubber operating variables include the liquor flow rate and the fan rotation speed. The liquor suspended solids and pH are important since these determine the rate of erosion and corrosion of the fan blades.

8.6.1.4 Gas-Atomized Scrubbers - This category includes all scrubbers which atomize the liquid stream by accelerating the gas stream in a restricted throat. The most common gas-atomized scrubbers include venturis, orifice scrubbers, and rod scrubbers. A typical venturi is shown in Figure 8-15. The gas stream enters from the top and passes down the converging section to the throat. The liquor is injected at a position close to the throat entrance. The gas stream within the throat, moving at velocities between 15,000 and 40,000 feet per minute, atomizes and accelerates the water droplets. Impaction of particles occurs on the droplets.

Some venturi designs include adjustable throat mechanisms so that the gas velocity can be varied. Normally one or two wear resistant vanes are used for this service. The gas stream is decelerated in the diverging section of the venturi and is directed to a demister vessel for removal of the entrained water droplets. Common demister designs include cyclonic chambers and cylindrical chambers with either chevrons or mesh pads.



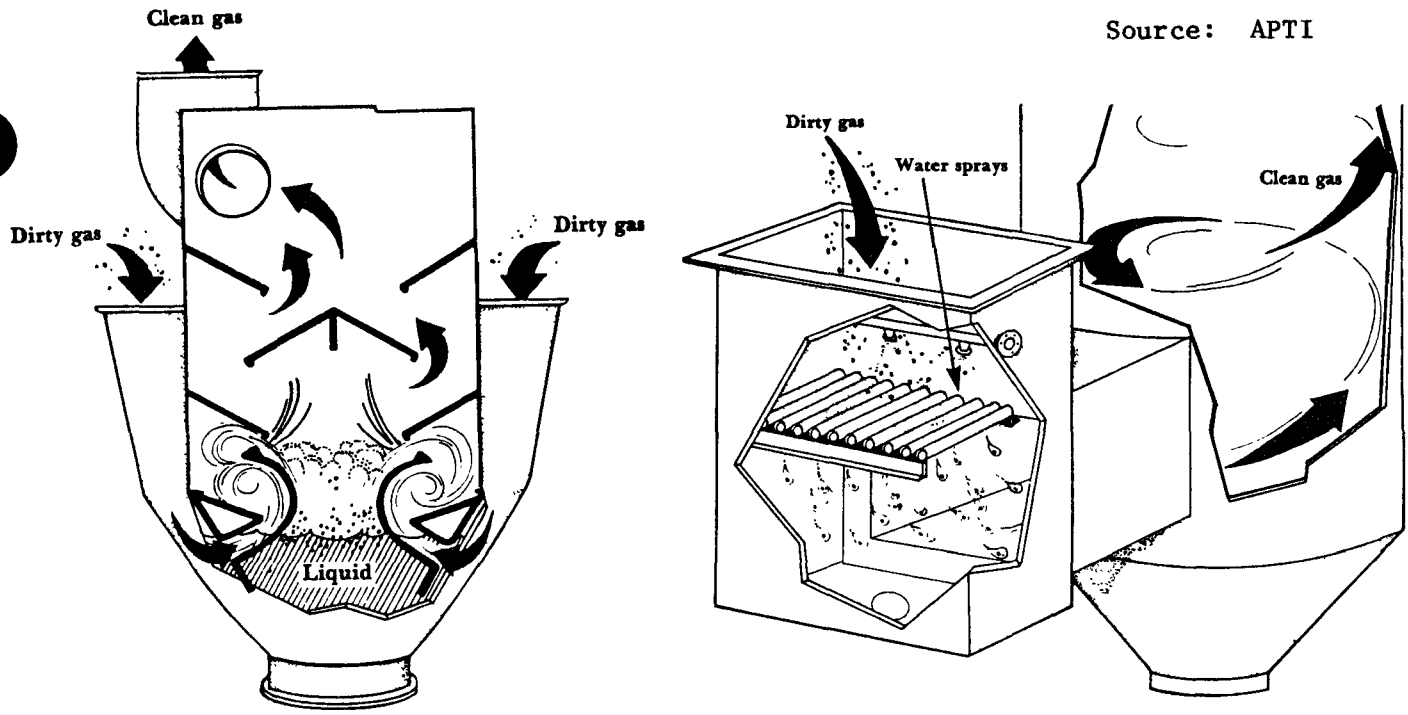
Source: APTI

Figure 8-15. Venturi Scrubber.

The important operating variables include the particle size distribution, the static pressure drop across the throat, and the liquor-to-gas ratio. The surface tension may also influence the particle collection efficiency, especially for difficult-to-wet materials. The degree of gas-liquor maldistribution is an important factor since most particle collection occurs rapidly in the top of the throat. The liquor solids content and the pH both influence the rate of erosion and corrosion of the shell and determine the useful life of the liquor nozzles near the throat. Pollutants arriving at the scrubber as vapors may not be effectively collected since the gas stream will pass through the throat before the material condenses to a particulate form and grows to a sufficient size to impact.

Two other examples of gas-atomized scrubbers are illustrated in Figures 8-16 a and b. The first shows a single stage rod type scrubber. The spaces between the rods comprise the area of gas stream acceleration and droplet atomization. A set of spray nozzles above this deck serves to distribute the liquor evenly across the open area. The second scrubber is an orifice unit. With this type of scrubber, the gas stream is forced through a narrow area underneath a partition. The turning gas stream entrains some of the liquor in a pool beneath the gas inlet. The atomized droplets serve as impaction targets for the particles. These orifice scrubbers are generally smaller than the venturi and rod scrubbers.

Source: APTI



a. Orifice Scrubber b. Rod Scrubber

Figure 8-16. Gas-Atomized Scrubbers.

The inspection procedures for the rod type and orifice type gas-atomized scrubbers are similar to those for the standard venturi scrubbers. The operating principles are also similar.

8.6.2 Level 1 Inspections of Particulate Wet Scrubbers

The procedures for a Level 1 inspection are the same for all types of wet scrubbers. For large wet scrubber systems, it is usually possible to use a plant boundry line plume observation to determine if the visible emissions are in compliance with the regulatory limits. The stacks for small scrubbers are often obscured by plant buildings and structures. Entry to plant grounds is necessary to complete Level 1 inspections of these units. Fugitive emissions from process sources and scrubber system bypass stacks are also checked from various vantage points either inside or outside the facility.

Areas near the scrubber stack should be visited to determine if there is any significant fallout of entrained scrubber droplets due to an inadequate demister or a severe stack reentrainment condition. The presence of obvious corrosion of the scrubber shell and the associated components should be noted if the unit can be seen well from the observation point.

Weather conditions obviously limit possible time periods for a Level 1 inspection. During periods of cold temperatures and/or high humidity it may be difficult to find a location in the plume free of condensed water droplets. At a minimum, the inspector should attempt to characterize the residual plume as: small, moderate, or large. During such periods a Level 2 inspection may be the only option.

8.6.3 Level 2 Inspections of Particulate Wet Scrubbers

The Level 2 inspection can be conducted as part of a routine inspection program or as a follow-up evaluation of unusual conditions noted during a Level 1 inspection. This consists of a walk-through inspection of the scrubber system and the associated process sources served by the scrubber. No portable instruments are used.

8.6.3.1 Level 2 Inspections of Spray Tower Scrubbers - The Level 2 inspection is done in a counterflow manner, starting with the observation of the scrubber stack emissions. Method 9 procedures should be used to determine the average opacity. The visible emissions should be observed for sufficient time to determine if the opacity varies significantly during normal cycles of the process equipment. Due to the limited particulate control capability of spray tower scrubbers, there may be periods when the particle size distribution shifts into a smaller, less collectable range. The reentrainment of droplets from the scrubber stack should be noted. In addition to obvious rainout of the droplets, the presence of a mud "lip" at the stack discharge is a symptom of reentrainment.

The vibration of the induced draft fan (if present) should be noted prior to continuing the inspection. If the vibration appears to be severe, the inspection should be discontinued since there is a possibility that the unit will disintegrate.

Physical condition of the shell and ductwork should be evaluated for signs of erosion and corrosion. The locations of all holes should be noted and the degree of damage described. On scrubbers operating under negative pressures, these holes can have high ambient air infiltration rates which reduces the quantity of gas pulled from the process equipment. Accordingly, the process equipment should be evaluated for poor pollutant capture.

A sample of the liquor leaving the scrubber should be requested so that the turbidity and suspended solids levels can be qualitatively evaluated. If plant personnel have a pH meter on site, the inspector should request a pH measurement. The inspector should inquire about the source and quality of any make-up water. The liquor flow rate should be recorded from on-site gauges. If these are not available, the rate of flow from the scrubber to a pond or recirculation tank should be qualitatively assessed. The recirculation pump discharge pressure and the liquor pressures at the nozzle headers should be recorded, if monitored. These pressures provide an indication of the liquor flow rates and of the conditions of the spray nozzles within the scrubber vessel. The presence of audible pump cavitation should be noted since this is often a symptom of reduced liquor flow rate and reduced liquor pressure. The ultimate disposal technique for the liquor purged from the scrubber system should be evaluated against regulatory requirements.

If a pond is used for the recirculation liquor, the location of the pump intake should be checked. It should be low enough to provide the required Net Positive Suction Head, but not so low that suspended solids are reentrained from the bottom of the pond. The pond should be designed to facilitate solids settling.

If the spray tower scrubber is out-of-service and locked out, it may be possible to inspect the spray nozzles for signs of pluggage and erosion. This should be done only when there is safe and convenient access to this portion of the scrubber vessel. Under no circumstances should the inspector enter the scrubber since inhalation hazards could exist, footing is usually poor, and it is possible to damage the corrosion resistant liners found in some units.

8.6.3.2 Level 2 Inspections of Packed Bed, Moving Bed and Tray Scrubbers - The evaluation of visible emissions from the scrubber stack are performed first using Method 9 procedures. The average opacity should be calculated and compared against both the baseline levels and the regulatory limit. Droplet fallout close to the stack and the presence of a lip of material at the stack discharge are symptoms of reentrainment.

The liquor flow rate is determined from on-site monitors, if available. An indirect indication of liquor flow rate can be obtained by noting the recirculation pump discharge pressure and the pressures of the headers supplying the nozzles at the tops of the scrubbers. Audible pump cavitation also indicates a reduced liquor flow rate.

Pressure drop across tray tower and moving bed tower scrubbers is observed from the on-site gauges. Shifts from baseline levels are indicative of either gauge malfunction or shifts in the gas and liquor flow rates. A change in the pressure drop of a packed tower scrubber is indicative of either a change in the gas flow rate or pluggage of the bed. If the on-site gauges indicate a significant change in the scrubber pressure drop, either a Level 3 inspection should be performed or a stack test requested.

Turbidity of the recirculation liquor is very important when evaluating both the packed tower and tray tower scrubbers. Both are sensitive to pluggage. Therefore, the suspended solids must be low. High turbidity is a clear sign of an undesirable suspended solids level. Data concerning the pH of the liquor should be requested from plant personnel along with the source and qualtiy of any make-up water used.

The scrubber vessel and the ductwork should be inspected for obvious erosion and corrosion. The extent to which this damage reduces pollutant capture at the source should be checked by evaluation of the visible fugitive emissions and/or evaluation of hood static pressure data (if available).

When the scrubber is out-of-service and locked off-line, the conditions of the trays or beds can be observed from the access hatches. Common problems include pluggage of the beds, pluggage of the holes in the trays, and sagging of the trays. Any factors which could lead to gas-liquor maldistribution should be described. Pluggage of the demister in the top of the scrubber should be observed. The physical conditions of the nozzles can also be observed if there is a safe and convenient access hatch directly below the nozzle headers. Under no circumstances should the inspector attempt to enter the scrubber vessel since there could be inhalation hazards, weakly supported trays and supports, and vulnerable corrosion resistant linings.

8.6.3.3 Inspections of Mechanically Aided Particulate Wet Scrubbers - Evaluation of visible emissions is done using Method 9 procedures. The average opacity is calculated and compared with both the baseline levels and the regulatory limits. The presence of reentrainment is determined by apparent rainout close to the stack and a lip of mud at the discharge point.

The liquor flow rate is determined from the on-site gauges on the liquor recirculation line. Indirect indicators of liquor flow include pressure gauges on the line leading to the spray nozzles and the recirculation pump discharge pressure gauge. Audible pump cavitation should be noted as a potential cause of reduced liquor flow.

The physical condition of the shell and ductwork should be examined for possible erosion and corrosion. Damage here is indicative of potential problems with the fan blades. This can cause frequent outages of the scrubber system for cleaning or repair of the scrubber fan. The liquor turbidity must be relatively low to minimize the erosion and solids accumulation on the rotating fan blades. The inspector should inquire about source and quality of the make-up liquor.

Sites of audible air infiltration should be noted. A walk-through inspection of the ductwork and process equipment served is necessary to check for visible fugitive emissions. A hood static pressure gauge provides a useful check of the shift in air capture rates since the baseline period. However, many small hoods do not have such a gauge.

As with any wet scrubber, the pH of the liquor is important. If there is apparent corrosion, the plant personnel should be requested to take a sample during the inspection and determine the pH.

8.6.3.4 Inspections of Gas-Atomized Particulate Wet Scrubbers - Method 9 procedures are used to determine the average opacity of the effluent gas stream. This is compared to both the baseline values and the regulatory limits. Reentrainment symptoms such as rainout close to the stack and a mud lip at the discharge point are noted in the inspection report. The Method 9 procedures are also used for any bypass stacks and vents included in the system.

Before entering the area near the scrubber system, a brief check of fan vibration should be made. If the vibration appears to be severe, the inspection should be postponed and the plant management should be notified of the potentially dangerous situation.

The pressure drop across the scrubber should be determined from the on-site gauges. The position of the instrument taps should be noted along with the value of the pressure drop so that the meaning of the number is clear. If available, the scrubber inlet gas temperature should be recorded. If there has been a significant decrease in the static pressure drop, either a Level 3 inspection or a stack test is recommended.

A liquor sample from the scrubber discharge should be requested so that the turbidity and pH can be evaluated. Plant instruments should be used to determine the pH. The rate of solids settling provides an indirect indication of the erosive characteristic of the liquor. Another sample is needed from the line serving any evaporative coolers or presaturators ahead of the gas-atomized scrubber vessel. The presence of high suspended solids here may indicate some particulate regeneration due to droplet evaporation. The inspector should inquire about the source and quality of any make-up liquor.

The physical condition of the scrubber vessel and ductwork should be inspected for visible signs of erosion and corrosion. The principal areas of erosion are elbows and turns in the ductwork and any portion of the scrubber where the gas velocities are high. If there are visible holes or audible air infiltration, a check for process fugitive emissions should be made to see if pollutant capture has been seriously hampered.

The liquor flow rate can often be determined from flow monitors on the recirculation line leading to the scrubber throat. Other indirect indications of the flow rate include the pump discharge pressure gauge, the nozzle header pressure gauge, and the pump motor currents. Pump cavitation is usually a sign of reduced liquor flow and impending pump maintenance problems.

Pluggage of one of more of the nozzles located near the scrubber throat can sometimes be identified by checking the pipe skin temperatures. A noticeable difference between the skin temperatures leading to the various nozzles is a sign that the colder lines lead to plugged or partially blocked nozzles.

The flowchart for the scrubber system should be reviewed for any major piping changes which would affect the performance of the scrubber or which affects the ultimate disposal of purged liquor. Modifications should be marked on this flowchart and discussed with plant management personnel.

8.6.4. Level 3 Inspections of Particulate Wet Scrubbers

A Level 3 inspection may be performed at a source with chronic compliance problems or at a source where a Level 1 or Level 2 inspection has indicated possible compliance problems. As a follow-up inspection, it is necessary to confirm: (1) if there is in fact a major shift from baseline conditions, and (2) if the operator's proposed corrective actions have a reasonable chance of minimizing the problem in the future. If there are doubts about the source's approach, a stack test is recommended.

Use of portable instrumentation is an important aspect of Level 3 wet scrubber inspections. It allows for a much more complete and accurate evaluation of performance on those systems lacking some or all of the scrubber monitoring instruments. Higher quality data is also possible, since on-site gauges can be malfunctioning during an inspection. It is difficult to keep static pressure gauges, liquid flow meters, liquid pressure gauges, and pH meters operating on some systems, due to the internal conditions.

A Level 3 inspection is conducted while the scrubber system is operating. Therefore, there are no internal checks made of the system components.

There are some elements of Level 3 inspections which are common to all four main categories of wet scrubbers. Visible emissions from the stack should be observed using Method 9 procedures for a sufficient period of time to characterize the average opacity. Any cyclic pattern to the average opacity should be described so it is possible to relate this to process operational cycles. The emissions from all scrubber bypass stacks and vents should be checked. There is little sense in performing a detailed inspection of a wet scrubber if a significant portion of the gas stream is escaping to the atmosphere through a bypass stack or duct. There should be no apparent particulate and/or "steam" emissions from these points unless there is an ongoing malfunction.

Any rainout of particulate laden droplets close to the scrubber stack is probably due to reentrainment of liquor from the scrubber demister. Another indication of reentrainment is a mud lip at the stack. If these symptoms are noted, the demister should be inspected. The pressure drop should be measured using the portable static pressure gauge. The demister cleaning schedule and type of liquor used for cleaning should be discussed with management personnel. The turbidity of the liquor used for cleaning should be observed.

Before entering the area around the scrubber system, fan vibration should be checked by simply walking by. If it appears to be severe, the inspection should be terminated since it conceivable that the fan could disintegrate. Plant management should be advised of this potentially dangerous situation. The inspection should be rescheduled as soon as the condition is corrected.

Apparent corrosion and erosion of the scrubber vessel, ductwork and other system components should be characterized. If there appears to be significant air infiltration, an attempt should be made to characterize the impact on pollutant capture. If there is an adequate measurement port upstream of the scrubber system, a pitot traverse should be conducted to determine the present gas flow rate. The stack measurement ports should be used for the traverse, if safe and convenient ports are not available upstream of the scrubber. It should be noted that the pitot traverse data demonstrates the degree of change since the baseline period due to both air infiltration and process operation factors. Additional information is necessary to complete documentation of any potential infiltration conditions.

One means to document air infiltration on scrubbers serving combustion sources is to measure the oxygen and carbon dioxide content of the gas stream entering the scrubber. An increase in the oxygen content is usually a clear sign of air infiltration. It should be noted, however, that the degree of infiltration cannot be quantified simply by comparison with baseline data. In many combustion systems, the oxygen and carbon dioxide concentrations normally vary in a narrow range as a function of load. To quantify the infiltration using these measurements, it is necessary to measure the oxygen and carbon dioxide concentrations of the flue gas directly after the combustion source. The incremental increase in the oxygen levels is related to the rate of infiltration. One some systems, the locations of infiltration can be identified by preparing an oxygen profile for the ductwork leading from the source to the scrubber inlet.

Hood static pressures provide an indication of the gas flow through a hood. If it has dropped relative to baseline values without a corresponding change in the process operating rate, air infiltration is possible.

Liquor flow rate is important in the evaluation of all wet scrubber systems. However, there are no portable instruments available to permit the inspector to make independent measurements. Therefore, continued reliance on on-site flow monitors and the use of indirect flow indicators are included in the Level 3 inspection procedures. A change in the pump discharge pressure and a decrease in the pump motor currents usually indicate a decrease in the liquor flow. Audible cavitation of the pump is often accompanied by a significant decrease in liquor flow and greatly accelerated pump wear. Another indicator of flow changes is a change in the nozzle header pressure. All of these indirect indicators should be used in conjunction with the on-site flow monitor to assess the liquor flow rate.

Recirculation liquor pH and scrubber effluent liquor pH should be measured using the portable pH meter. The scrubber effluent liquor usually has the lowest pH and, therefore, is the most corrosive. The pH of this stream can characterize one of the major corrosion problems within the scrubber vessel. The recirculation liquor pH measurement characterizes conditions in the recirculation tank, the recirculation pump, and the piping. Recirculation liquor pH is normally higher than scrubber effluent liquor pH due to the additon of alkaline additives in the recirculation tank. If the pH levels appear low, the performance of the alkaline addition system should be checked.

The turbidity of the recirculation liquor should be visibly checked during the inspection. High turbidity can be associated with accelerated pump impeller wear, piping pluggage and erosion, nozzle pluggage and erosion, and scaling within the scrubber vessel. If turbidity has increased since the baseline period, an evaluation of the following is advisable: (1) make-up and purge stream flow rates, (2) operation of clarifier, and (3) condition of ponds or settling basins. The inspector should also inquire about make-up water, source and quality. The quantities of surfactants, flocculants and anti-foaming solutions used should be recorded.

The settling rate of the liquor should be qualitatively evaluated. Solids which settle rapidly are normally large diameter, erosive type particles. There is a greater chance for erosion damage with the rapidly settling solutions.

If the unit has been subject to nozzle pluggage or line freezing, the inspector should evaluate the adequacy of the piping layout. All of the lines should be sloped slightly to allow drainage during cold weather off-line periods. A small level is useful to check that all lines are sloped downward to a point where there is a drain. Non-drainable portions of the line due to pipe deflection between supports or due to the use of valves which prevent drainage (i.e. globe valves) should be noted. Also provisions to flush out the piping on a routine basis must be available if pluggage of nozzles is frequent. This can consist of the use of tees rather than elbows and the use of unions at several points along the line. The design requirements necessary to allow drainage of liquor also favor flushing of solids. There should also be a means to flush out the horizontal headers which supply the nozzles.

If recirculation pump failure has been frequent, the inspector should check the following items: (1) the pump suction line, (2) the pump discharge line, and (3) the pump seal water flow. The pump intake must have sufficient net positive suction head to prevent cavitation within the casing. The suction line should be sloped to prevent air pockets and there should be valves to prevent accumulation of air in the suction line during off-line periods. The discharge line should be properly supported so that loads are not placed on the pump shaft and bearing. Also the discharge line valves should be selected so that water hammer is not transmitted to the pump. High quality seal water is usually necessary to prevent damage to the pump bearings.

During the inspection the scrubber system flowchart originally prepared during a previous Level 4 inspection should be checked for accuracy. Of particular interest is any change in the make-up and purge water rates and any change in the means of ultimate disposal of the liquor.

In the following subsections, the inspection points which are unique to each of the major classes of wet scrubbers are presented. These steps are in addition to the inspection steps discussed immediately above.

8.6.4.1. Level 3 Inspections of Spray Tower Scrubbers - The performance of spray towers is very sensitive to the operation and orientation of the spray nozzles. Problems with the nozzles can lead to severe gas-liquor maldistribution and/or low liquor flow.

The nozzles must be selected properly so that the desired spray pattern results. Full cone, hollow cone and fan spray type nozzles are available. Also, nozzles are selected partially on the basis of the desired spray angle. The inspector should evaluate the types of nozzles in present service versus those used in the scrubber originally. It is necessary to have a sketch or drawing of the nozzle layout in the scrubber to make this evaluation. In considering the adequacy of the nozzle selection, the inspector must also keep in mind the differences in susceptibility to pluggage and erosion for those systems in which the suspended solids levels are high.

Gas-liquor maldistribution cannot be accurately quantified during an inspection. One indication of this problem is an unsaturated gas stream at the outlet of the scrubber. Fluctuations in the temperature measured by the portable thermocouple may be due to a difference between the wet bulb and dry bulb temperatures. An increase in the overall scrubber effluent gas temperature may also indicate poor gas liquor distribution.

Nozzle pluggage can cause severe distribution problems and reduce the overall liquor flow rate. One symptom of nozzle pluggage is an increase in the pressure of the header serving the nozzles. Unfortunately, there are rarely any pressure gauges on this line.

8.6.4.2. Level 3 Inspections of Packed Bed, Moving Bed and Tray Scrubbers - The static pressure drop across the scrubber vessel should be measured. The ports should be located at the scrubber inlet and at a point prior to the demister. For moving bed and tray scrubbers, the comparison of the pressure drop against baseline values provides an indirect measure of the particulate

removal performance. Decreases in the static pressure drop are due to decreases in the gas flow rate and/or decreases in the liquor flow rate and/or pluggage of some of the beds or trays. If ports are available across each moving bed or tray, these can be used to check pluggage.

The pressure drop across the packed bed provides an indication of the gas flow rate through the scrubber. If this has dropped significantly, a pitot traverse should be conducted at the scrubber outlet to quantify the decrease in gas flow rates. Also, checks for fugitive emissions from the process area should be made.

Fiberglass ductwork and plastic components are common in these types of scrubbers. Both are sensitive to damage in the event of the loss of liquor flow. Signs of damage should be noted in the inspection report. The provisions for emergency flushing of the system when liquid flow is lost should be examined if this has occurred previously.

The packed bed and tray tower scrubbers are very sensitive to suspended solids levels. If pluggage appears to be a problem, a sample of the liquor and make-up water should be obtained for later analysis of suspended and total solids.

8.6.4.3. Level 3 Inspections of Mechanically Aided Scrubbers - The performance of the mechanically aided scrubber (only the wet fan design discussed earlier) is dependent on the fan rotational speed. This should be measured using a tachometer if there is a safe and convenient location for the measurement. Another indication of the fan speed is the static pressure increase.

Since it is difficult to modify the gas flow rate without affecting the scrubbing effectiveness, many operators will include air intake vents on the suction side of the ductwork to control the amount of air drawn from the source of the particulate. These vents, along with the capture efficiency at the source, should be checked to confirm that there are no fugitive emissions.

Liquor suspended solids levels are important due to the potential wear of the scrubber fan blades. If there have been frequently reported erosion problems, a liquor sample should be obtained for later analyses of suspended and total solids. Also, the liquor treatment system should be reviewed to determine if there has been an increase in the solids levels since the baseline period.

8.6.4.4. Level 3 Inspections of Gas-Atomized Scrubbers - The static pressure drop across the scrubber vessel should be measured using the portable static pressure gauges since the pressure drop is related to the overall particulate removal effectiveness. The static pressures should be measured at a location ahead of the scrubber and at a point either before or after the demister. With these types of scrubbers, the contribution of the demister to the overall pressure drop is relatively minor due to the normally high static pressure drop across the scrubber. Gas temperature data should be measured along with the static pressure measurements since the pressure drop must be corrected for gas density changes across the scrubber. If there has been a decrease in the density corrected static pressure drop relative to the baseline levels, the following conditions should be evaluated: (1) low gas flow rate, (2) low liquor flow rate, (3) poor gas-liquor distribution in the throat, and (4) change in the area of the restricted throat.

If there has been a decrease in the static pressure drop, the gas flow rate at the scrubber discharge should be measured using a pitot tube. The pressure drop across a gas-atomized scrubber with a fixed throat is related to the square of the gas flow rate. Therefore, small changes in the gas flow since the baseline period can have a large impact on the pressure drop. If the gas flow rate is constant on fixed throat units, the most likely cause of reduced static pressure drop is a decrease in the liquor flow.

On variable throat gas-atomized scrubbers, the position of the control mechanism should be determined to the extent possible. If the pitot traverse indicates no change in gas flow rate since the baseline period while there has been a decrease in the pressure drop, the throat area probably has been increased.

It is difficult to determine or quantify the degree of liquor maldistribution. The skin temperatures of the pipes leading to the nozzles should be measured and compared against each other. A slight drop in a line compared to the others often means a plugged pipe or nozzle. A difference in the wet and dry bulb temperatures at the scrubber exit is proof of unsaturated conditions which in turn suggests poor gas-liquor distribution.

Gas-atomized scrubbers are often used on high gas temperature sources. However, it is necessary to cool the gas stream prior to entry to the scrubber. The quality of the liquor used in presaturators and evaporative coolers is very important since regeneration of particulate can occur if droplets containing solids evaporate to dryness. A sample of the water used in these coolers should be obtained for later analyses of total solids content.

8.6.5 Level 4 Inspections of Particulate Wet Scrubbers

The Level 4 inspections are performed to obtain baseline data concerning the wet scrubber system and the associated process equipment. Only data relevant to the performance of the air pollution control system should be obtained. Acquistion of potentially confidential data should be avoided unless absolutely necessary. This inspection should be done by a senior agency engineer experienced with wet scrubber inspection and evaluation.

The optimum time for compilation of baseline data is during a stack test. The basic operational data (pressure drops, liquor flows and pressures, gas temperatures) should be obtained for each of the separate Method 5 or Method 17 runs. If more than one stack test has been performed on this system the data concerning pressure drop (gas-atomized, moving bed and tray scrubbers) should be compiled in a plot of the outlet particulate concentration versus the corrected pressure drop (simply the pressure drop divided by the average gas density in the scrubber). This plot can then be used as a rough indicator of performance.

Samples of all liquor streams should be obtained and analyzed. The measurements should include: suspended solids, total solids, pH, chloride content, fluoride content, and turbidity. This data will be useful in determining possible reasons for corrosion, erosion and pluggage.

A complete flowchart should be prepared on the scrubber system. This should show every major component such as presaturators, evaporative coolers, clarifiers, vacuum filters, pumps, alkaline additive systems, demisters, and fans. The locations of any bypass stacks and dampers should be marked. All liquor flows should be indicated including the make-up stream, the purge stream, demister cleaning flows, and seal-water streams. Standard instrumentation symbols should be used to denote on-site gauges and measurement ports.

With the agreement of the plant management, the stack sampling program can be expanded to provide a more detailed set of baseline data. Multiple stack sampling runs can be performed while basic scrubber operational parameters are intentionaly modified. The result is a plot showing the effluent particulate concentration as a function of a basic operating parameter. The type of plots vary with the type of scrubber as indicated in the list below:

Scrubber	Plot
Gas-Atomized Scrubbers	Concentration versus Corrected Pressure Drop
Tray Scrubbers	Concentration versus Corrected Pressure Drop
Moving Bed Scrubbers	Concentration versus Corrected Pressure Drop
Mechanically Aided Scrubbers (Wet Fans)	Concentration versus R.P.M. or Pressure Rise
Packed Tower Scrubbers	Not Applicable
Spray Tower Scrubbers	Concentration versus Liquor Flow Rate

In the case of the gas-atomized scrubbers the pressure drop should be adjusted by varying the gas velocity rather than changing the liquor flow rate. Changing the liquor flow rate can induce areas of poor gas-liquor distribution that would not otherwise exist.

TABLE 8-16. LEVEL 1 INSPECTION OF PARTICULATE WET SCRUBBERS

- Inspection Steps
  - Method 9 observation of the stack for a period not less than 6 minutes; calculate average opacity and compare with regulatory limit and baseline values
  - Method 9 observation of fugitive emissions from scrubber bypass stacks and process sources
  - Plume color and dimensions relative to typical conditions (i.e. small, typical, large)
  - Presence of droplet deposition in areas adjacent to stacks
  - Note visible corrosion of the scrubber shell and ductwork

- Evaluation
  - If the average opacity has increased by 5% since the baseline period or if the average opacity is within 5% of the regulatory limit, a Level 2 inspection is warranted
  - There should be no visible emissions or "steam plumes" from any of the bypass vents and stacks
  - Plume color is useful for identifying condensing or reactive plume constitutents

- Safety Considerations
  - Location(s) selected for observations should be protected from moving vehicles (cars, trains, and heavy equipment) and should provide secure footing; coal piles and material stockpiles are not suitable

- Special Notes
  - Avoid trespassing on private property to reach a good location for observations (unless public access is allowed)
  - If plant entry is necessary to observe the equipment, the normal plant entry procedures are applicable
  - If the observations will probably form the basis for a NOV results should be provided to source as soon as possible

TABLE 8-17. LEVEL 2 INSPECTIONS OF SPRAY TOWER SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack for a period of not less than 6 minutes; calculate average opacity and describe cycles in the average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout close to the stack or mud lips at the discharge point
  - Presence of fan vibration
  - Liquor flow rate indicated by on-site flow monitor
  - Pump discharge pressure and motor current indicated by on-site gauges
  - Audible pump cavitation
  - Nozzle header pressure indicated by on-site gauge
  - Physical condition of shell and ductwork
  - Recirculation pond layout and pump intake position
  - Physical condition of nozzles observed through access hatch
  - Note means used to dispose of purged liquor

- Evaluation
  - A shift in the average opacity may be due to a decrease in the particle size distribution of the inlet gas stream; a co-current inspection of the process operation is often advisable
  - Anything which affects the nozzles will reduce performance; liquor turbidity is related to the vulnerability to nozzle pluggage and erosion
  - Shell and ductwork corrosion is often caused by operation at pH levels which are lower than desirable; measure the liquor pH using in-plant instruments, if available
  - Performance of a spray tower scrubber is dependent on the liquor flow rate; any problems which potentially reduce the flow rate should be fully examined

- Safety Considerations
  - Check all ladders and platforms before use; safe climbing and walking practices are important, especially in cold weather
  - Avoid poorly ventilated areas
  - Avoid hot duct and pipes
  - Terminate inspection if a severly vibrating fan is noted in the vicinity of the scrubber
  - Under no circumstances should inspector attempt to look inside an operating wet scrubber
  - Visible emission observations should be made only in secure areas

- Special Notes
  - Observations and data do not provide conclusive evidence of noncompliance; they can be used only as a general indicator of performance

TABLE 8-18. LEVEL 2 INSPECTIONS OF PACKED BED SCRUBBERS, MOVING BED SCRUBBERS AND TRAY-TOWER SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack for a period of not less than 6 minutes; calculate average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout close to the stack or mud lips at the discharge
  - Presence of fan vibration
  - Static pressure drop across moving bed and tray tower scrubbers
  - Liquor flow rate indicated by on-site flow monitor
  - Pump discharge pressure and motor current indicated by on-site gauges
  - Audible pump cavitation
  - Nozzle header pressure indicated by on-site gauge
  - Physical condition of shell and ductwork
  - Recirculation pond layout and pump intake position
  - Physical condition of trays and beds observed through access hatch
  - Means used to dispose of purged liquor
  - Turbidity of recirculation liquor

- Evaluation
  - A shift in the average opacity may be due to a decrease in the particle size distribution of the inlet gas stream; a co-current inspection of the process operation is often advisable
  - Anything which reduces the pressure drop of moving bed scrubbers and tray tower scrubbers will reduce the performance; reduced liquor flow rates should be checked if pressure drop is low; indirect indications of reduced liquor flow rate include increased pump discharge pressure, increased nozzle header pressure, and decreased pump motor currents
  - Shell and ductwork corrosion is often caused by operation at pH levels which are lower than desirable; measure the liquor pH using in-plant instruments, if available
  - Performance of packed bed and tray tower scrubbers is very vulnerable to pluggage problems caused by high suspended solids in the recirculation liquor

- Safety Considerations
  - Check all ladders and platforms before use; safe climbing and walking practices are important at all times
  - Avoid poorly ventilated areas
  - Avoid hot ducts and pipes
  - Terminate the inspection if a severly vibrating fan is noted in the general vicinity of the scrubber
  - Under no circumstances should inspector attempt to look inside an operating wet scrubber
  - Visible emission observations should be made only in secure areas

- Special Notes
  - Inspection data and observations do not provide conclusive evidence of violation of mass emission standards; these can be used only as a general indicator of performance

TABLE 8-19. LEVEL 2 INSPECTIONS OF MECHANICALLY AIDED SCRUBBERS

- Inspection Steps
  - Method 9 observation of the stack for a period of not less than 6 minutes; calculate average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout close to the stack or mud lips at the discharge point
  - Presence of fan vibration
  - Liquor flow rate indicated by on-site flow monitor
  - Pump discharge pressure and motor current indicated by on-site gauges
  - Audible pump cavitation
  - Nozzle header pressure indicated by on-site gauge
  - Physical condition of shell and ductwork
  - Recirculation pond layout and pump intake position
  - Note means used to dispose of purged liquor
  - Static pressure increase across scrubber monitored by on-site gauge

- Evaluation
  - Shift in the average opacity may be due to a decrease in the particle size distribution of the inlet gas stream; a co-current inspection of the process operation is often advisable
  - Liquor turbidity is related to the vulnerability of the fan blades to erosion damage
  - Shell and ductwork corrosion is often caused by operation at pH levels which are lower than desirable; measure liquor pH using in-plant instruments, if available
  - Performance of a mechanically aided scrubber is dependent on liquor flow rate; any problems which potentially reduce the flow rate should be fully examined; indirect indications of liquor flow rate include pump discharge pressure, nozzle header pressure, pump motor currents, and audible pump cavitation

- Safety Considerations
  - Check all ladders and platforms before use; safe climbing and walking practices are important at all times
  - Avoid poorly ventilated areas
  - Avoid hot duct and pipes
  - Terminate inspection if the fan is vibrating severly
  - Under no circumstances should inspector attempt to look inside an operating wet scrubber
  - Visible emission observations should be made only in secure areas

- Special Notes
  - Inspection data and observations do not provide conclusive evidence of violation of mass emission standards; these can be used only as a general indicator of performance

TABLE 8-20. LEVEL 2 INSPECTIONS OF GAS-ATOMIZED SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack for a period of not less than 6 minutes; calculate average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout close to the stack or mud lips at the discharge
  - Presence of fan vibration
  - Liquor flow rate indicated by on-site flow monitor
  - Static pressure drop across the scrubber indicated by on-site gauge
  - Pump discharge pressure and motor current indicated by on-site gauges
  - Audible pump cavitation
  - Nozzle header pressure indicated by on-site gauge
  - Physical condition of shell and ductwork
  - Recirculation pond layout and pump intake position
  - Physical condition of nozzles observed through access hatch
  - Note means used to dispose of purged liquor should be noted

- Evaluation
  - Shift in the average opacity may be due to a decrease in particle size distribution of the inlet gas stream; a co-current inspection of the process operation is often advisable
  - Anything which affects the nozzles will reduce performance; liquor turbidity is related to the vulnerability to nozzle pluggage and erosion
  - Shell and ductwork corrosion is often caused by operation at pH levels which are lower than desirable; measure liquor pH using in-plant instruments, if available
  - Performance of a gas-atomized scrubber is partially dependent on the liquor flow rate; any problems which potentially reduce the flow rate should be fully examined
  - Overall performance of a gas-atomized wet scrubber is related to the static pressure drop except in cases where there is a particle size shift, a change in the liquor surface tension, or gas-liquor maldistribution problems

- Safety Considerations
  - Check all ladders and platforms before use; safe climbing and walking practices are important at all times
  - Avoid poorly ventilated areas
  - Avoid hot duct and pipes
  - Terminate inspection if a severly vibrating fan is noted in the general vicinity of the scrubber
  - Under no circumstances should inspector attempt to look inside an operating wet scrubber
  - Visible emission observations should be made only in secure areas

- Special Notes
  - Inspection data and observations do not provide conclusive evidence of violation of mass emission standards; these can be used only as a general indicator of performance

TABLE 8-21. LEVEL 3 INSPECTIONS OF SPRAY TOWER SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack over a sufficient time to characterize average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout and/or mud lip at stack discharge
  - Fan vibration conditions
  - Pump discharge pressure and motor current
  - Presence of audible pump cavitation
  - Presence of pump seal water flow
  - Liquor flow rate indicated by on-site gauge
  - Nozzle header pressure
  - Liquor turbidity and pH
  - Physical condition of scrubber shell, ductwork and piping
  - Presence of drains and line flushing capability
  - Pump suction line conditions
  - Turbidity of liquor used to clean demisters
  - Types of nozzles used in scrubber
  - Pitot traverse of scrubber inlet or outlet ducts

- Evaluation
  - Only those measurements and observations relevant to the suspected problem should be conducted
  - Evaluate types of nozzles in present use with respect to the spray angle and type of spray pattern developed
  - High turbidity can be associated with nozzle pluggage, nozzle erosion, pump impeller wear, and pipe erosion
  - Air infiltration may result in high fugitive emissions
  - Reduced pump discharge pressure, reduced pump motor currents, and changes in the nozzle header pressures may be associated with reduced liquor flow these can seriously reduce scrubber performance

- Safety Considerations
  - All climbing and walking safety practices are important
  - Avoid poorly ventilated areas, especially around positive pressure vessels and ducts
  - Avoid contact with hot ducts, pipes, and probes
  - Ground all portable instruments used on the scrubber inlet; in areas of possible gas vapors or particulate clouds only intrinsically safe instruments should be used
  - Obtain liquor samples so that the liquor does not splash

- Special Notes
  - Plant management should be advised that the evaluation of the Level 3 data is used only to aid the inspector in evaluating scrubber performance and possible corrective actions planned; it is not intended to restrict the operator's options in running the unit
  - Level 3 data does not conclusively demonstrate non-compliance with mass emission requirements

TABLE 8-22. LEVEL 3 INSPECTIONS OF PACKED BED, MOVING BED AND TRAY SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack over a sufficient time to characterize average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout and/or mud lip at stack discharge
  - Fan vibration conditions
  - Static pressure drop across entire scrubber
  - Static pressure drop across each tray or bed
  - Pump discharge pressure and motor current
  - Presence of audible pump cavitation
  - Presence of pump seal water flow
  - Liquor flow rate indicated by on-site gauge
  - Nozzle header pressure
  - Liquor turbidity and pH
  - Physical condition of scrubber shell, ductwork and piping
  - Presence of drains and line flushing capability
  - Pump suction line conditions
  - Turbidity of liquor used to clean demisters
  - Types of nozzles used in scrubber
  - Pitot traverse of scrubber inlet or outlet ducts

- Evaluation
  - Only those measurements and observations relevant to the suspected problem should be conducted
  - Static pressure drop across moving bed and tray scrubbers is related to the overall particulate efficiency; decreases from the baseline levels should be examined
  - High turbidity can be associated with pluggage of packed beds and trays; both conditions lead to severe gas-liquid maldistribution
  - Air infiltration may result in high fugitive emissions
  - Reduced pump discharge pressure, reduced pump motor currents, and changes in the nozzle header pressures may be associated with reduced liquor flow; these can seriously reduce scrubber performance

- Safety Considerations
  - All climbing and walking safety practices are important
  - Avoid poorly ventilated areas
  - Avoid contact with hot ducts, pipes, and probes
  - Ground all portable instruments used on the scrubber inlet; in areas of possible gas vapors or particulate clouds, only intrinsically safe instruments should be used
  - Splashing is hazardous while obtaining a liquor sample

- Special Notes
  - Plant management should be advised that the evaluation of the Level 3 data is used only to aid the inspector in evaluating scrubber performance and possible corrective actions planned; it is not intended to restrict the operator's options in running the unit
  - Level 3 data does not conclusively demonstrate non-compliance with mass emission requirements

TABLE 8-23. LEVEL 3 INSPECTIONS OF MECHANICALLY AIDED SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack over a sufficient time to characterize average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout and/or mud lip at stack discharge
  - Fan vibration conditions
  - Static pressure increase across scrubber
  - Scrubber rotational speed
  - Pump discharge pressure and motor current
  - Presence of audible pump cavitation
  - Presence of pump seal water flow
  - Liquor flow rate indicated by on-site gauge
  - Nozzle header pressure
  - Liquor turbidity and pH
  - Physical condition of scrubber shell, ductwork and piping
  - Presence of drains and line flushing capability
  - Pump suction line conditions
  - Turbidity of liquor used to clean demisters
  - Types of nozzles used in scrubber
  - Pitot traverse of scrubber inlet or outlet ducts

- Evaluation
  - Only those measurements and observations relevant to the suspected problem should be conducted
  - Scrubber rotational speed is proportional to particulate control effectiveness; if the rotational speed cannot be safely measured, static pressure rise should be measured
  - High turbidity can be associated with rapid erosion of scrubber fan blades and with pluggage of spray nozzles
  - Air infiltration may result in high fugitive emissions
  - Reduced pump discharge pressure, reduced pump motor currents, and changes in nozzle header pressures may be associated with reduced liquor flow; these can seriously reduce scrubber performance

- Safety Considerations
  - All climbing and walking safety practices are important
  - Avoid poorly ventilated areas
  - Avoid contact with hot ducts, pipes, and probes
  - Ground all portable instruments used on the scrubber inlet; in areas of possible gas vapors or particulate clouds only intrinsically safe instruments should be used
  - Splashing liquids can be hazardous while obtaining samples

- Special Notes
  - Plant management should be advised that the evaluation of the Level 3 data is used only to aid the inspector in evaluating scrubber performance and possible corrective actions planned; it is not intended to restrict the operator's options in running the unit
  - Level 3 data does not conclusively demonstrate non-compliance with mass emission requirements

TABLE 8-24. LEVEL 3 INSPECTIONS OF GAS-ATOMIZED SCRUBBERS

- Inspection Steps
  - Method 9 observation of stack over a sufficient time to characterize average opacity
  - Method 9 observation of all bypass stacks and vents and any fugitive emissions from process equipment
  - Presence of rainout and/or mud lip at stack discharge
  - Fan vibration conditions
  - Static pressure drop across scrubber
  - Static pressure drop across demister
  - Pump discharge pressure and motor current
  - Presence of audible pump cavitation
  - Presence of pump seal water flow
  - Liquor flow rate indicated by on-site gauge
  - Nozzle header pressure
  - Recirculation liquor turbidity and pH
  - Scrubber effluent liquor pH
  - Evaporative cooler or presaturator turbidity and total solids
  - Physical condition of scrubber shell, ductwork and piping
  - Presence of drains and line flushing capability
  - Pump suction line conditions
  - Turbidity of liquor used to clean demisters
  - Pitot traverse of scrubber inlet or outlet ducts
  - Orifice scrubber liquid level
  - Skin temperatures of pipes serving individual nozzles

- Evaluation
  - Only those measurements and observations relevant to the suspected problem should be conducted
  - Pressure drop, corrected for gas density changes, is a useful indicator of particulate removal efficiency; decreases since the baseline period should be full investigated
  - High turbidity can be associated with nozzle pluggage, nozzle erosion, pump impeller wear, and pipe erosion
  - Air infiltration may result in high fugitive emissions

- Safety Considerations
  - All climbing and walking safety practices are important
  - Avoid poorly ventilated areas
  - Avoid contact with hot ducts, pipes, and probes
  - Ground all portable instruments used on the scrubber inlet; in areas of possible gas vapors or particulate clouds only intrinsically safe instruments should be used
  - Splashing liquids can be hazardous while obtaining a liquid sample

- Special Notes
  - Plant management should be advised that the evaluation of the Level 3 data is used only to aid the inspector in evaluating scrubber performance and possible corrective actions planned; it is not intended to restrict the operator's options in running the unit
  - Level 3 data does not conclusively demonstrate non-compliance with mass emission requirements

TABLE 8-25. LEVEL 4 INSPECTIONS OF PARTICULATE WET SCRUBBERS

- Inspection Steps
  - All specific inspection steps for Level 3 inspections are included in the Level 4 inspection
  - Prepare a detailed flowchart of the scrubber system
  - Evaluate conformance of system to construction and/or operating permit requirements
  - Obtain samples of the recirculation liquor, purge liquor, system make-up liquor, water used in evaporative coolers, and water used in presaturators
  - Note any conditions which would represent a hazard during Level 2 or 3 inspections
  - Evaluate types of records to be kept and summarize malfunction reporting procedures agreed upon with source management

- Evaluation
  - Compile and summarize baseline data; emphasize parameters which may govern particulate control efficiency
  - Prepare specific guidelines for conducting Level 2 and 3 inspections (modify list of inspection steps provided here to adapt to actual system)

- Safety Considerations
  - All climbing and walking safety practices are important
  - Avoid poorly ventilated areas, especially around positive pressure vessels and ducts
  - Avoid contact with hot ducts, pipes, and probes
  - Ground all portable instruments used on the scrubber inlet; in areas of possible gas vapors or particulate clouds only intrinsically safe instruments should be used
  - Obtain liquor samples in a manner so that the liquor does not splash

- Special Notes
  - Plant management should be advised that the evaluation of the baseline data is used only to aid the inspector in evaluating scrubber performance and possible corrective actions planned; it is not intended to restrict the operator's options in running the unit
  - Copies of the baseline data and any plots prepared should be sent to the plant management

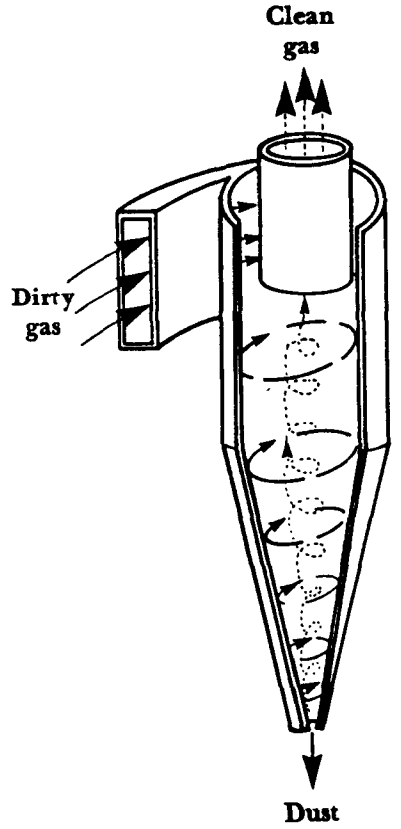
8.7 INSPECTION OF MECHANICAL COLLECTORS

Baseline Inspection Technique procedures for the inspection and evaluation of mechanical collectors are discussed in this section. Brief descriptions of the major types of units in commercial service and of the operating principles of these collectors are presented. The inspection data and observations necessary to characterize performance are presented.

8.7.1 Descriptions of Mechanical Collectors

The two major categories of mechanical collectors are large diameter cyclones and multi-cyclone collectors. The large diameter units have a very limited particle-size related collection capability. Therefore, these are used only when the particle size is quite large. The multi-cyclone units have a much greater control capability and have been successfully used on a number of combustion sources and materials handling sources.

8.7.1.1 Large Diameter Cyclones - A single large diameter cyclone is illustrated in Figure 8-17. The gas stream enters near the top of the cyclone through the tangentially oriented inlet duct. The gas stream spins several times before turning up and exiting through the center outlet tube. Due to inertia, most of the particles do not turn with the gas but instead concentrate near the wall. The particulate matter than falls into the hopper and is removed from the collector.



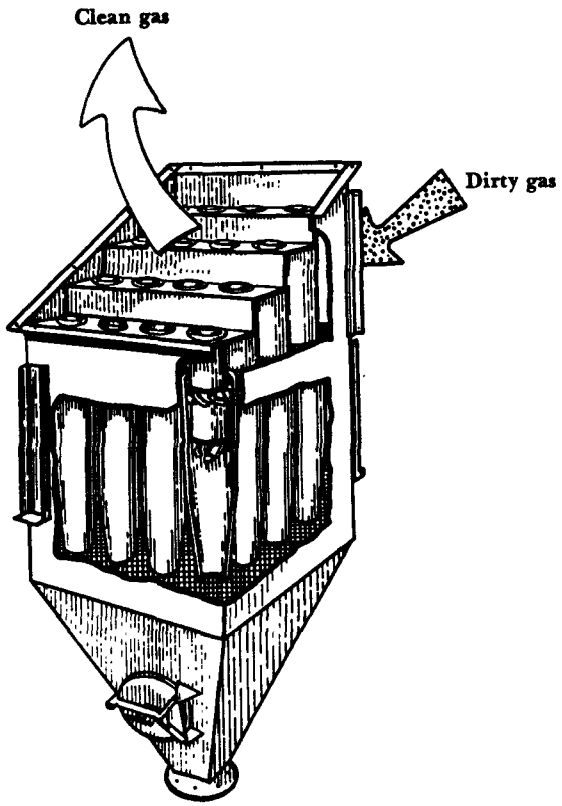
Source: APTI

Figure 8-17. Large Diameter Cyclone.

The efficiency of the unit is partially dependent on the inlet gas flow rate since this determines the gas velocities within the cyclone. As a general rule, the efficiency is a function of the square of the gas flow rate. One way to enchance cyclone velocities is to use banks of relatively small diameter cyclones rather than a single larger cyclone for a given gas stream. It is common to have 2 to 8 large diamter cyclones mounted together for this purpose. The physical condition of the cyclone body also affects the removal efficiency. Dents, riveted joints and other surface irregularities can disrupt the vortex within the cyclone, thereby causing particles to bounce back into the center of the cyclone and be emitted. Air infiltration up through the solids discharge valve, through holes or through weld failures can also disrupt the vortex.

The typical large cyclones have sizes ranging from 1 foot to more than 12 feet in diameter. The pressure drops, which are a function of gas flow rate, vary from one inch of water to several inches of water. The lack of measurement ports on many units makes inspection very difficult.

8.7.1.2 Multi-Cyclone Collectors - These collectors gain enhanced collection efficiency by the use of a number of small diameter cyclone tubes mounted in a single chamber. The higher centrifugal forces within the small 3 inch to 12 inch tubes allows higher efficiency removal of small particles. This is done at the expense of higher static pressure drops across the unit, with values in the range of 2 inches of water to 8 inches of water. A sketch of a common multi-cyclone unit is shown in Figure 8-18.



Source: APTI

Figure 8-18. Multi-Cyclone Collector.

The gas stream enters the unit between the "clean" side and "dirty" side tubesheets. Spinner vanes mounted near the top of each cyclone tube cause the gas to rotate as it passes downward. As with the large diameter cyclones, particle inertia causes the particles to leave the gas stream flow and to concentrate near the wall of the tube. The gas stream turns 180° and passes upward through the outlet tube. The solids are removed from the hopper on a continuous basis. Commercial multi-cyclone units have from 16 to 200 individual tubes in a single collector.

The overall efficiency is related to the square of the gas flow rate. Common operating problems include pluggage of the spinner vanes, erosion of the outlet tubes, gasket failures, air infiltration, and hopper overflow. Some of the larger units may suffer from cross hopper flow which is simply clean gas flow from several of the front tubes down through the hopper and up through the bottom of tubes near the back of the collector.

8.7.2 Level 1 Inspections of Mechanical Collectors

The Level 1 inspection procedures for both major types of mechanical collectors is similar. A plant boundry Method 9 observation of the stack is done if the control device discharge is visible. The average opacity is compared to both the baseline values and the regulatory limit. Any cycles in the visible emissions are characterized so that it is possible to relate these to process operating cycles. It should be noted that the materials collected most efficiently by mechanical collectors do not scatter light very effectively. Therefore, even a small increase in the opacity can be associated with a large increase in the mass emissions. One symptom of high mass emissions is the accumulation of piles of settled solids in the vicinity of the collector discharge or stack. Common areas of accumulation include adjacent building roofs, horizontal ductwork leading to and from the collector, and support beams. All such areas should be checked for obvious deposits.

Method 9 observations should be conducted of the process area served by the collector. Any fugitive emissions from material or fuel stockpiles should be noted.

On some of the systems, especially the large diameter cyclones, the unit does not have a stack and the discharge point is too low to be seen from outside plant grounds. In such cases, plant entry is necessary to complete this portion of the inspection.

8.7.3 Level 2 Inspections of Mechanical Collectors

The Level 2 inspection consists of a walk through check of the overall system including the evaluation of data provided by on-site permanently mounted gauges. Such inspections are not time consuming since the mechanical collector systems are relatively simple.

8.7.3.1 Level 2 Inspections of Large Diameter Cyclones - The visible emissions from large diameter cyclones should be observed using Method 9 procedures. If the process equipment operates in a cyclic manner, the stack should be observed for a sufficient period of time to fully characterize the visible

emissions. If the plume has a bluish white or light brown tint, the particulate matter is probably too small to be effectively collected in the large diameter cyclone. In such a case, a co-current inspection of the process operation and raw materials is a necessary part of the inspection.

After making the visible emission observation, checks should be made for accumulated materials in the vicinity of the stack. It is possible to have large mass emissions of large diameter particulate with only slight opacity.

The condition of the collector shell should be checked to the extent possible. Any dents, erosion holes, or gaps in welds and joints should be noted in the inspection report. Air infiltration up through the cyclone discharge may be caused by the lack of a solids discharge valve. If audible leakage is occurring, this should also be noted.

The static pressure drop across the large diameter cyclone should be recorded from on-site gauges if there are installed gauges and they appear to be working properly. This provides one indication of the flow rate through the cyclone.

The ductwork leading from the process equipment to the cyclone should be checked for sites of air infiltration. Any hoods which exist should be checked to determine: (1) if the hood(s) is in the proper position to capture the particulate, (2) if the hood has been damaged, (3) if the blast gates on the ductwork are open, and (4) if the hood static pressure has changed since the baseline period. Fugitive emissions from the process area should be observed using Method 9 procedures.

8.7.3.2 Level 2 Inspections of Multi-Cyclone Collectors - The inspection starts with a Method 9 observation of the plume visible emissions. The average opacity should be calculated and compared with both the baseline values and the regulatory limit. An increase of 5% opacity over the baseline levels should be of concern even if the regulatory limit has not yet been exceeded.

The pressure drop across the collector should be recorded if there are installed gauges and they appear to be working properly. The pressure drop should be directly related to the process operating rate. Therefore, if the observed value is either higher or lower than expected for the present operating conditions, it is probable that there are internal problems within the collector.

Audible air infiltration points around the collector hopper area, the solids discharge valve, and the ductwork leading to the collector should be identified to the extent possible. It should be noted that these systems usually operate at elevated temperatures and there is usually only limited accessibility to the collector. For this reason, it is difficult to safely approach the units to find the air infiltration points.

The process equipment should be evaluated for any factors which affect the quantity and collectability of particulate matter generated. Combustion sources should be checked for changes in fuel characteristics, outlet oxygen concentrations, and undesirable firing conditions. Material handling operations should be checked for anything which affects the amount and particle sizes of material entrained in the gas stream.

8.7.4 Level 3 Inspections of Mechanical Collectors

This type of inspection is conducted as a follow-up to the Level 2 inspection or as a routine procedure for certain units with chronic compliance problems. Portable instrumentation is used to gain data which is often unavailable due to the lack of permanently mounted on-site gauges. An attempt is made to determine the general nature of the problem(s), if any, so that the corrective actions proposed by the operators can be evaluated.

The visible emission observations are identical to those conducted as part of level 2 inspections. These should include the stack discharge, process equipment areas, material handling operations, and any stockpiles of raw materials and fuels.

8.7.4.1 Level 3 Inspections of Large Diameter Cyclones - If measurement ports can be reached safely and conveniently, a pitot traverse can be conducted across the inlet to a large diameter cyclone. This data can be used to evaluate the impact of air infiltration in the cyclone and outlet ductwork. As in the case of Level 2 inspections, all audible air infiltration points in the cyclone shell, hopper area, and solids discharge valve area should be characterized.

Another pitot traverse can be conducted near the hood serving the process equipment. This provides an indication of the total quantity of gas being pulled from this area which in turn is related directly to the particulate capture effectiveness. A significant difference between the hood outlet flow and the cyclone inlet flow is a clear indication of air infiltration in the connecting ductwork. The hood static pressure can also be measured (if there is safe and convenient accessibility) using the 0-5 inch static pressure gauge. The value of the static pressure is related to the total gas flow through the hood.

The process equipment should be inspected for any conditions which affect either the quantity or characteristics of the particulate matter. Of particular concern is anything which would lead to the formation of fine particles which are inherently not collectable in a large diameter cyclone.

8.7.4.2 Level 3 Inspections of Multi-Cyclone Collectors - If there is safe and convenient access to measurement ports before and after the multi-cyclone collector, the following measurements should be made using the portable instruments: (1) static pressure, (2) gas temperature, (3) gas flow rates and (4) oxygen and carbon dioxide concentrations. The latter measurements are only appropriate when combustion sources are being inspected. This data can be used to determine if there has been a change in the resistance to flow in the cyclone tubes or if there is significant air infiltration in the unit. The inlet port measurements also provide some information regarding the performance conditions of the process equipment.

To determine if there is a change in the gas flow resistance the static pressure drop must be corrected for the present gas flow rate using the equation presented below.

$$P_c = P_m \left(\frac{Q_a^2}{Q_b^2} \right)$$

Where:
P_c= Corrected Static Pressure Drop
P_m= Measured Static Pressure Drop
Q_a= Measured Gas Flow Rate
Q_b= Baseline Gas Flow Rate

If the corrected static pressure drop is significantly different than the baseline static pressure drop, then a change in resistance has occurred. A decrease normally means higher emissions due to erosion of the outlet tubes or failure of the gaskets. An increase in the resistance usually means increased emissions due to partially plugged spinner vanes.

For multi-cyclones serving combustion sources (with the exception of most driers), the oxygen measurements provide a means to evaluate air infiltration problems. If the outlet oxygen concentration is more than 1% higher than the inlet, the rate of infiltration is high. This can cause higher emissions by disrupting the vortices within the cyclone tubes. The cooling effect of the infiltration may also lead to severe solids emptying problems in the hopper. Another clear indicaion of air infiltration problems is a major drop in the gas temperature across the multi-cyclone collector.

An increase in the inlet oxygen value as compared to baseline levels suggests combustion problems with the process equipment. In this case, the condition should be confirmed by measuring the oxygen concentration at a point as close as possible to the outlet of the boiler or combustion source.

8.7.5 Level 4 Inspections of Mechanical Collectors

The Level 4 inspections are identical in scope to the Level 3 inspections. The measurements are conducted to provide data on normal gas flow rates, static pressure drops, inlet gas temperatures, and inlet oxygen concentrations (if applicable). Hood static pressures should also be measured to document the gas flow conditions at the process area.

A flowchart of the system should be prepared showing all process sources served by the system. The locations of all measurement ports and on-site permanently mounted gauges should be shown on this chart.

The optimum time for a Level 4 inspection is during a stack test of the system to verify compliance with mass emission regulations. However, such tests are rarely done for large diameter cyclones. In this case, the Level 4 inspection should be done during a period when the visible emissions are low, the process is operating in a representative fashion, and there are no obvious solids settling problems.

TABLE 8-26. LEVEL 1 INSPECTIONS OF MECHANICAL COLLECTORS

- Inspection Steps
  - Method 9 observation of the stack for a sufficient period to fully characterize conditions during normal process cycles
  - Method 9 observation of any fugitive emissions from process equipment, material handling operations, and stockpiles
  - Presence of accumulated solids in the vicinity of the stack
  - Presence of obvious holes and dents in cyclone shell

- Evaluation
  - If the visible emissions have increased by more than 5% since the baseline period or if the visible emissions are within 5% of the regulatory limit, a Level 2 or Level 3 inspection is warranted
  - Accumulated solids near the stack generally imply high mass emissions composed of large particles which do not scatter light effectively
  - Fugitive emissions from the process area can be at least partially due to air infiltration into the ductwork or collector; check the process area and ductwork in any subsequent Level 2 or 3 inspections

- Safety Considerations
  - Positions selected for the Method 9 observations should be secure from moving vehicles such as cars, trains, and moving machinery
  - Footing must be secure; stockpiles are not acceptable
  - If plant entry is necessary, all standard in-plant safety considerations apply

- Special Notes
  - Avoid trespassing on private property to reach a good location for observations (unless public access is allowed)
  - Information which may be used to support a notice of violation should be supplied to source management as soon as possible to satisfy "due process" requirements

TABLE 8-27. LEVEL 2 INSPECTIONS OF LARGE DIAMETER CYCLONES

- Inspection Steps
  - Method 9 observation of the stack for a sufficient period to fully characterize conditions during normal process cycles
  - Method 9 observation of any fugitive emissions from process equipment, material handling operations, and stockpiles
  - Presence of accumulated solids in the vicinity of the stack
  - Presence of obvious holes and dents in cyclone shell
  - Air infiltration sites on cyclone shell, cyclone hopper, solids discharge valve, and inlet ductwork
  - Obvious corrosion of cyclone
  - Static pressure drop across cyclone as indicated by on-site gauge

- Evaluation
  - If the visible emissions have increased more than 5% since the baseline period or if the visible emissions are within 5% of the regulatory limit, a Level 2 or Level 3 inspection is recommended
  - Accumulated solids near the stack generally imply high mass emissions composed of large particles which do not scatter light effectively
  - Fugitive emissions from the process area can be at least partially due to air infiltration into ductwork or collector; check process area and ductwork in any subsequent Level 2 or 3 inspections
  - Holes and dents in shell can disrupt the gas vortex, causing some particulate reentrainment and emissions
  - Static pressure provides an indication of the flow rate; removal efficiency generally increases with the static pressure

- Safety Considerations
  - Positions selected for the Method 9 observations should be secure from moving vehicles such as cars, trains, and moving machinery
  - Footing must be secure; stockpiles are not acceptable
  - All climbing and walking safety procedures are very important; some horizontal structures may not be able to withstand the load of accumulated solids and several people
  - Avoid contact with hot surfaces
  - Some fugitive leaks from the cyclone body and the cyclone discharge vents may contain high velocity materials which could cause eye injuries; avoid potential areas of exposure

- Special Notes
  - Information which may be used to support a NOV should be supplied to source management as soon as possible to satisfy "due process" requirements
  - Inspection results do not conclusively demonstrate noncompliance with mass emission regulations; they can, however, support either a stack test request or a Level 3 inspection

TABLE 8-28. LEVEL 2 INSPECTIONS OF MULTI-CYCLONE COLLECTORS

- Inspection Steps
  - Method 9 observation of stack for a sufficient period to fully characterize conditions during normal process cycles
  - Method 9 observation of any fugitive emissions from process equipment, material handling operations, and stockpiles
  - Air infiltration sites on collector shell, hopper, solids discharge valves, and inlet ductwork
  - Static pressure drop across collector as indicated by on-site gauge
  - Inlet gas temperature as indicated by on-site gauge

- Evaluation
  - If the visible emissions have increased more than 5% since baseline period or if the visible emissions are within 5% of the regulatory limit, a Level 2 or Level 3 inspection is recommended
  - Fugitive emissions from the process area can be at least partially due to air infiltration into ductwork or collector; check process area and ductwork in any subsequent Level 2 or 3 inspections
  - Static pressure provides an indication of the flow rate and the resistance to gas flow; static pressure should be checked against baseline static pressure drops for similar process operating rates; the present value is higher, then pluggage is possible; if it is lower, erosion of outlet tubes and gasket problems are likely

- Safety Considerations
  - Positions selected for the Method 9 observations should be secure from moving vehicles such as cars, trains, and moving machinery
  - Footing must be secure; stockpiles are not acceptable
  - All climbing and walking safety procedures are very important; some horizontal structures may not be able to withstand the load of accumulated solids and several people
  - Avoid contact with hot surfaces
  - Many multi-cyclone collectors are located in hot areas; avoid heat stress by limiting the time spent in the area (moderate heat conditions) or by not entering the area (high heat areas)
  - Avoid poorly ventilated areas

- Special Notes
  - Information which may be used to support a NOV should be supplied to source management as soon as possible to satisfy "due process" requirements
  - Inspection results do not conclusively demonstrate noncompliance with mass emission regulations; they can, however, support either a stack test request or a Level 3 inspection

TABLE 8-29. LEVEL 3 INSPECTIONS OF LARGE DIAMETER CYCLONES

- Inspection Steps
  - Method 9 observation of the stack for a sufficient period to fully characterize conditions during normal process cycles
  - Method 9 obaervation of any fugitive emissions from process equipment, material handling operations, and stockpiles
  - Presence of accumulated solids in the vicinity of the stack
  - Presence of obvious holes and dents in cyclone shell
  - Air infiltration sites on cyclone shell, cyclone hopper, solids discharge valves, and inlet ductwork
  - Obvious corrosion of cyclone
  - Static pressure drop across cyclone as measured by portable gauges
  - Inlet gas flow rate as indicated by pitot traverse
  - Hood static pressure as measured by portable gauges

- Evaluation
  - If the visible emissions have increased more than 5% opacity since the baseline period or if the visible emissions are within 5% of the regulatory limit, a stack test is recommended
  - Accumulated solids near the stack generally imply high mass emissions composed of large particles which do not scatter light effectively
  - Fugitive emissions from the process area can be at least partially due to air infiltration into the ductwork or collector; check process area and ductwork for infiltration using the hood static pressure value as a general index of gas flow
  - Holes and dents in the shell can disrupt the gas vortex, causing some particulate reentrainment and emission
  - Static pressure provides an indication of the flow rate; removal efficiency generally increases with the static pressure

- Safety Considerations
  - Positions selected for the Method 9 observations should be secure from moving vehicles such as cars, trains, and moving machinery
  - Footing must be secure; stockpiles are not acceptable
  - All climbing and walking safety procedures are very important; some horizontal structures may not be able to withstand the load of accumulated solids and several people
  - Avoid contact with hot surfaces, and hot probes
  - Some fugitive leaks from the cyclone body and the cyclone discharge vents may contain high velocity materials which could cause eye injuries; avoid potential areas of exposure

- Special Notes
  - Information which may be used to support a NOV should be supplied to the source management as soon as possible to satisfy "due process" requirements
  - Inspection results do not conclusively demonstrate noncompliance with mass emission regulations; these do, however, support a request for a stack test

TABLE 8-30. LEVEL 3 INSPECTIONS OF MULTI-CYCLONE COLLECTORS

- Inspection Steps
  - Conduct Method 9 observation as for Level 2 inspections
  - Air infiltration sites on shell, hoppers, and discharge valves
  - Static pressure drop across collector as indicated by portable gauge
  - Inlet and outlet gas temperatures as indicated by portable gauge
  - Inlet gas flow rates as indicated by pitot tube
  - Inlet and outlet gas oxygen levels as indicated by portable gauge
  - Inlet and outlet gas carbon dioxide concentrations
  - Combustion process outlet gas stream oxygen and carbon dioxide concentrations as indicated by portable gauges
  - Hood static pressure as indicated by portable gauge

- Evaluation
  - If the visible emissions have increased more than 5% opacity since the baseline period or if the visible emissions are above the regulatory limit, a stack test is recommended
  - Fugitive emissions from the process area can be at least partially due to air infiltration into the ductwork or collector; check process area and ductwork using pitot traverse at the process outlet and the control device inlet; measure hood static pressure
  - Static pressure provides an indication of the flow rate and the resistance to gas flow; correct to present gas flow conditions using the pitot traverse at the collector inlet; corrected static pressure drop should be compared with the baseline static pressure drops; if the present value is higher, pluggage is possible; if the static pressure drop is now lower, erosion of outlet tubes and gasket problems are likely
  - Increases in the oxygen values of 1% oxygen or more in the outlet as compared to the inlet indicates air infiltration
  - Increases in the oxygen concentration of the gas stream entering the collector indicates combustion system operating problemms if the process operating rate has remained constant

- Safety Considerations
  - Positions selected for the Method 9 observations should be secure from moving vehicles such as cars, trains, and moving machinery
  - All climbing and walking safety procedures are very important; some horizontal structures may not be able to withstand the load of accumulated solids and several people
  - Avoid contact with hot surfaces
  - Many multi-cyclone collectors are located in hot areas; avoid heat stress by limiting the time spent in the area (moderate heat conditions or by not entering the area (high heat areas)
  - Avoid poorly ventilated areas

- Special Notes
  - Information which may be used to support a NOV should be supplied to the source management as soon as possible; inspection results do not conclusively demonstrate noncompliance with mass emission regulations

TABLE 8-31. LEVEL 4 INSPECTIONS OF MECHANICAL COLLECTORS

- Inspection Steps
  - Inspection steps for a Level 4 inspection are identical to those listed for a Level 3 inspection
  - Prepare a flowchart of the system
  - Check conformance with all applicable construction and/or operating permit requirements

- Evaluation
  - Prepare a specific list of inspection steps for the actual system
  - Summarize the baseline measurements

- Safety Considerations
  - Safety considerations for a Level 4 inspection are identical to those for a Level 3 inspection

- Special Notes
  - Plant management should be advised that the baseline data is intended to assist inspectors evaluate performance and does not restrict their prerogatives in operating the equipment
  - Baseline data set should be provided to plant personnel

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APPENDIX A

CLEAN AIR ACT

95th Congress
1st Session

COMMITTEE PRINT

THE CLEAN AIR ACT
AS AMENDED AUGUST 1977

NOVEMBER 1977

SERIAL NO. 95-11

Printed for the use of the Senate
Committee on Environment and Public Works

U.S. GOVERNMENT PRINTING OFFICE
99-302 O WASHINGTON : 1977

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THE CLEAN AIR ACT[1]

TITLE I—AIR POLLUTION PREVENTION AND CONTROL

PART A—AIR QUALITY AND EMISSION LIMITATIONS

FINDINGS AND PURPOSES

SEC. 101. (a) The Congress finds—

(1) that the predominant part of the Nation's population is located in its rapidly expanding metropolitan and other urban areas, which generally cross the boundary lines of local jurisdictions and often extend into two or more States;

(2) that the growth in the amount and complexity of air pollution brought about by urbanization, industrial development, and the increasing use of motor vehicles, has resulted in mounting dangers to the public health and welfare, including injury to agricultural crops and livestock, damage to and the deterioration of property, and hazards to air and ground transportation;

(3) that the prevention and control of air pollution at its source is the primary responsibility of States and local governments; and

(4) that Federal financial assistance and leadership is essential for the development of cooperative Federal, State, regional, and local programs to prevent and control air pollution.

(b) The purposes of this title are—

(1) to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population;

(2) to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution;

(3) to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and

(4) to encourage and assist the development and operation of regional air pollution control programs.

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[1] Clean Air Act (42 U.S.C. 1857 et seq.) includes the Clean Air Act of 1963—P.L. 88-206, and amendments made by the Motor Vehicle Air Pollution Control Act—P.L. 89-272 (October 20, 1965), the Clean Air Act Amendments of 1966—P.L. 89-675 (October 15, 1966), the Air Quality Act of 1967—P.L. 90-148 (November 21, 1967), the Clean Air Amendments of 1970—P.L. 91-604 (December 31, 1970), the Comprehensive Health Manpower Training Act of 1971—P.L. 92-157 (November 18, 1971), the Energy Supply and Environmental Coordination Act of 1974—P.L. 93-319 (June 22, 1974), Clean Air Act Amendments of 1977—P.L. 95-95 (August 7, 1977), and Safe Drinking Water Act of 1977—P.L. 95-190 (November 16, 1977).

COOPERATIVE ACTIVITIES AND UNIFORM LAWS

SEC. 102. (a) The Administrator shall encourage cooperative activities by the States and local governments for the prevention and control of air pollution; encourage the enactment of improved and, so far as practicable in the light of varying conditions and needs, uniform State and local laws relating to the prevention and control of air pollution; and encourage the making of agreements and compacts between States for the prevention and control of air pollution.

(b) The Administrator shall cooperate with and encourage cooperative activities by all Federal departments and agencies having functions relating to the prevention and control of air pollution, so as to assure the utilization in the Federal air pollution control program of all appropriate and available facilities and resources within the Federal Government.

(c) The consent of the Congress is hereby given to two or more States to negotiate and enter into agreements or compacts, not in conflict with any law or treaty of the United States, for (1) cooperative effort and mutual assistance for the prevention and control of air pollution and the enforcement of their respective laws relating thereto, and (2) the establishment of such agencies, joint or otherwise, as they may deem desirable for making effective such agreements or compacts. No such agreement or compact shall be binding or obligatory upon any State a party thereto unless and until it has been approved by Congress. It is the intent of Congress that no agreement or compact entered into between States after the date of enactment of the Air Quality Act of 1967, which relates to the control and abatement of air pollution in an air quality control region, shall provide for participation by a State which is not included (in whole or in part) in such air quality control region.

RESEARCH, INVESTIGATION, TRAINING, AND OTHER ACTIVITIES

SEC. 103. (a) The Administrator shall establish a national research and development program for the prevention and control of air pollution and as part of such program shall—

(1) conduct, and promote the coordination and acceleration of, research, investigations, experiments, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, and control of air pollution;

(2) encourage, cooperate with, and render technical services and provide financial assistance to air pollution control agencies and other appropriate

public or private agencies, institutions, and organizations, and individuals in the conduct of such activities;

(3) conduct investigations and research and make surveys concerning any specific problem of air pollution in cooperation with any air pollution control agency with a view to recommending a solution of such problem, if he is requested to do so by such agency or if, in his judgment, such problem may affect any community or communities in a State other than that in which the source of the matter causing or contributing to the pollution is located;

(4) establish technical advisory committees composed of recognized experts in various aspects of air pollution to assist in the examination and evaluation of research progress and proposals and to avoid duplication of research; and

(5) conduct and promote coordination and acceleration of training for individuals relating to the causes, effects, extent, prevention, and control of air pollution.

(b) In carrying out the provisions of the preceding subsection the Administrator is authorized to—

(1) collect and make available, through publications and other appropriate means, the results of and other information, including appropriate recommendations by him in connection therewith, pertaining to such research and other activities;

(2) cooperate with other Federal departments and agencies, with air pollution control agencies, with other public and private agencies, institutions, and organizations, and with any industries involved, in the preparation and conduct of such research and other activities;

(3) make grants to air pollution control agencies, to other public or nonprofit private agencies, institutions, and organizations, and to individuals, for purposes stated in subsection (a)(1) of this section;

(4) contract with public or private agencies, institutions, and organizations, and with individuals, without regard to sections 3648 and 3709 of the Revised Statutes (31 U.S.C. 529; 41 U.S.C. 5);

(5) establish and maintain research fellowships, in the Environmental Protection Agency and at public or nonprofit private educational institutions or research organizations;

(6) collect and disseminate, in cooperation with other Federal departments and agencies, and with other public or private agencies, institutions, and organizations having related responsibilities, basic data on chemical, physical, and biological effects of varying air quality and other information pertaining to air pollution and the prevention and control thereof; and

(7) develop effective and practical processes, methods, and prototype devices for the prevention or control of air pollution.

In carrying out the provisions of subsection (a), the Administrator shall provide training for, and make training grants to, personnel of air pollution control agencies and other persons with suitable qualifications and make grants to such agencies, to other public or nonprofit private agencies, institutions, and organizations for the purposes stated in subsection (a)(5). Reasonable fees may be charged for such training provided to persons other than personnel of air pollution control agencies but such training shall be provided to such personnel of air pollution control agencies without charge.

(c) In carrying out the provisions of subsection (a) of this section the Administration shall conduct research on, and survey the results of other scientific studies on, the harmful effects on the health or welfare of persons by the various known air pollutants.

(d) The Administrator is authorized to construct such facilities and staff and equip them as he determines to be necessary to carry out his functions under this Act.

(e) If, in the judgment of the Administrator, an air pollution problem of substantial significance may result from discharge or discharges into the atmosphere, he may call a conference concerning this potential air pollution problem to be held in or near one or more of the places where such discharge or discharges are occurring or will occur. All interested persons shall be given an opportunity to be heard at such conference, either orally or in writing, and shall be permitted to appear in person or by representative in accordance with procedures prescribed by the Administrator. If the Administrator finds, on the basis of evidence presented at such conference, that the discharge or discharges if permitted to take place or continue are likely to cause or contribute to air pollution subject to abatement under section 115, he shall send such findings, together with recommendations concerning the measures which he finds reasonable and suitable to prevent such pollution, to the person or persons whose actions will result in the discharge or discharges involved; to air pollution agencies of the State or States and of the municipality or municipalities where such discharge or discharges will originate; and to the interstate air pollution control agency, if any, in the jurisdictional area of which any such municipality is located. Such findings and recommendations shall be advisory only, but shall be admitted together with the record of the conference, as part of the proceedings under subsections (b), (c), (d), (e), and (f) of section 115.

(f)(1) In carrying out research pursuant to this Act, the Administrator shall give special emphasis to research on the short- and long-term effects of air pollutants on public health and welfare. In the furtherance of such

research, he shall conduct an accelerated research program—

(A) to improve knowledge of the contribution of air pollutants to the occurrence of adverse effects on health, including, but not limited to, behavioral physiological, toxicological, and biochemical effects; and

(B) to improve knowledge of the short- and long-term effects of air pollutants on welfare.

(2) In carrying out the provisions of this subsection the Administrator may—

(A) conduct epidemiological studies of the effects of air pollutants on mortality and morbidity;

(B) conduct clinical and laboratory studies on the immunologic, biochemical, physiological, and the toxicological effects including carcinogenic, teratogenic, and mutagenic effects of air pollutants;

(C) utilize, on a reimbursable basis, the facilities of existing Federal scientific laboratories and research centers;

(D) utilize the authority contained in paragraphs (1) through (4) of subsection (b); and

(E) consult with other appropriate Federal agencies to assure that research of studies conducted pursuant to this subsection will be coordinated with research and studies of such other Federal agencies.

(3) In entering into contracts under this subsection, the Administrator is authorized to contract for a term not to exceed 10 years in duration. For the purposes of this paragraph, there are authorized to be appropriated $15,000,000. Such amounts as are appropriated shall remain available until expended and shall be in addition to any other appropriations under this Act.

RESEARCH RELATING TO FUELS AND VEHICLES

SEC. 104 (a) The Administrator shall give special emphasis to research and development into new and improved methods, having industrywide application, for the prevention and control of air pollution resulting from the combustion of fuels. In furtherance of such research and development he shall—

(1) conduct and accelerate research programs directed toward development of improved, low-cost techniques for—

(A) control of combustion byproducts of fuels,

(B) removal of potential air pollutants from fuels prior to combustion,

(C) control of emissions from the evaporation of fuels,

(D) improving the efficiency of fuels combustion so as to decrease atmospheric emissions, and

(E) producing synthetic or new fuels which,

when used, result in decreased atmospheric emissions.

(2) provide for Federal grants to public or nonprofit agencies, institutions, and organizations and to individuals, and contracts with public or private agencies, institutions or persons, for payment of (A) part of the cost of acquiring, constructing, or otherwise securing for research and development purposes, new or improved devices or methods having industrywide application of preventing or controling discharges into the air of various types of pollutants; (B) part of the cost of programs to develop low emission alternatives to the present internal combustion engine; (C) the cost to purchase vehicles and vehicle engines, or portions thereof, for research, development, and testing purposes; and (D) carrying out the other provisions of this section, without regard to sections 3648 and 3709 of the Revised Statutes (31 U.S.C. 529; 41 U.S.C. 5): *Provided*, That research or demonstration contracts awarded pursuant to this subsection or demonstration contracts awarded pursuant to this subsection (including contracts for construction) may be made in accordance with, and subject to the limitations provided with respect to research contracts of the military departments in, section 2353 of title 10, United States Code, except that the determination, approval, and certification required thereby shall be made by the Administrator: *Provided further*, That no grant may be made under this paragraph in excess of $1,500,000;

(3) determine, by laboratory and pilot plant testing, the results of air pollution research and studies in order to develop new or improved processes and plant designs to the point where they can be demonstrated on a large and practical scale;

(4) construct, operate, and maintain, or assist in meeting the cost of the construction, operation, and maintenance of new or improved demonstration plants or processes which have promise of accomplishing the purposes of this Act;

(5) study new or improved methods for the recovery and marketing of commercially valuable byproducts resulting from the removal of pollutants.

(b) In carrying out the provisions of this section, the Administrator may—

(1) conduct and accelerate research and development of low-cost instrumentation techniques to facilitate determination of quantity and quality of air pollutant emissions, including, but not limited to, automotive emissions;

(2) utilize, on a reimbursable basis, the facilities of existing Federal scientific laboratories;

(3) establish and operate necessary facilities and test sites at which to carry on the research, testing, development, and programing necessary to effectuate the purposes of this section;

(4) acquire secret processes, technical data, inventions, patent applications, patents, licenses, and an interest in lands, plants, and facilities, and other property or rights by purchase, license, lease, or donation; and

(5) cause on-site inspections to be made of promising domestic and foreign projects, and cooperate and participate in their development in instances in which the purposes of the Act will be served thereby.

(c) For the purposes of this section there are authorized to be appropriated $75,000,000 for the fiscal year ending June 30, 1971, $125,000,000 for the fiscal year ending June 30, 1972, and $150,000,000 for the fiscal year ending June 30, 1973, $150,000,000 for the fiscal year ending June 30, 1974, and $150,000,000 for the fiscal year ending June 30, 1975. Amounts appropriated pursuant to this subsection shall remain available until expended.

GRANTS FOR SUPPORT OF AIR POLLUTION PLANNING AND CONTROL PROGRAMS

SEC. 105. (a)(1)(A) The Administrator may make grants to air pollution control agencies in an amount up to two-thirds of the cost of planning, developing, establishing, or improving, and up to one-half of the cost of maintaining, programs for the prevention and control of air pollution or implementation of national primary and secondary ambient air quality standards.

(B) Subject to subparagraph (C), the Administrator may make grants to air pollution control agencies within the meaning of paragraph (1), (2), or (4) of section 302(b) in an amount up to three-fourths of the cost of planning, developing, establishing, or improving, and up to three-fifths of the cost of maintaining, any program for the prevention and control of air pollution or implementation of national primary and secondary ambient air quality standards in an area that includes two or more municipalities, whether in the same or different States.

(C) With respect to any air quality control region or portion thereof for which there is an applicable implementation plan under section 110, grants under subparagraph (B) may be made only to air pollution control agencies which have substantial responsibilities for carrying out such applicable implementation plan.

(2) Before approving any grant under this subsection to any air pollution control agency within the meaning of sections 302(b)(2) and 302(b)(4) the Administrator shall receive assurances that such agency provides for

adequate representation of appropriate State, interstate, local, and (when appropriate) international, interests in the air quality control region.

(3) Before approving any planning grant under this subsection to any air pollution control agency within the meaning of sections 302(b)(2) and 302(b)(4), the Administrator shall receive assurances that such agency has the capability of developing a comprehensive air quality plan for the air quality control region, which plan shall include (when appropriate) a recommended system of alerts to avert and reduce the risk of situations in which there may be imminent and serious danger to the public health or welfare from air pollutants and the various aspects relevant to the establishment of air quality standards for such air quality control region, including the concentration of industries, other commercial establishments, population and naturally occurring factors which shall affect such standards.

(b) From the sums available for the purposes of subsection (a) of this section for any fiscal year, the Administrator shall from time to time make grants to air pollution control agencies upon such terms and conditions as the Administrator may find necessary to carry out the purpose of this section. In establishing regulations for the granting of such funds the Administrator shall, so far as practicable, give due consideration to (1) the population, (2) the extent of the actual or potential air pollution problem, and (3) the financial need of the respective agencies. No agency shall receive any grant under this section during any fiscal year when its expenditures of non-Federal funds for other than nonrecurrent expenditures for air pollution control programs will be less than its expenditures were for such programs during the preceding fiscal year, unless the Administrator, after notice and opportunity for public hearing, determines that a reduction in expenditures is attributable to a nonselective reduction in expenditures in the programs of all executive branch agencies of the applicable unit of Government; and no agency shall receive any grant under this section with respect to the maintenance of a program for the prevention and control of air pollution unless the Administrator is satisfied that such grant will be so used to supplement and, to the extent practicable, increase the level of State, local, or other non-Federal funds that would in the absence of such grant be made available for the maintenance of such program, and will in no event supplant such State, local, or other non-Federal funds. No grant shall be made under this section until the Administrator has consulted with the appropriate official as designated by the Governor or Governors of the State or States affected.

(c) Not more than 10 per centum of the total of funds appropriated or allocated for the purposes of subsection

(a) of this section shall be granted for air pollution control programs in any one State. In the case of a grant for a program in an area crossing State boundaries, the Administrator shall determine the portion of such grant that is chargeable to the percentage limitation under this subsection for each State into which such area extends. In fiscal year 1978 and subsequent fiscal years, subject to the provisions of subsection (b) of this section, no State shall receive less than one-half of 1 per centum of the annual appropriation for grants under this section for grants to agencies within such State.

(d) The Administrator, with the concurrence of any recipient of a grant under this section may reduce the payments to such recipient by the amount of the pay, allowances, traveling expenses, and any other costs in connection with the detail of any officer or employee to the recipient under section 301 of this Act, when such detail is for the convenience of, and at the request of, such recipient and for the purpose of carrying out the provisions of this Act. The amount by which such payments have been reduced shall be available for payment of such costs by the Administrator, but shall, for the purpose of determining the amount of any grant to a recipient under subsection (a) of this section, be deemed to have been paid to such agency.

(e) No application by a State for a grant under this section may be disapproved by the Administrator without prior notice and opportunity for a public hearing in the affected State, and no commitment or obligation of any funds under any such grant may be revoked or reduced without prior notice and opportunity for a public hearing in the affected State (or in one of the affected States if more than one State is affected).

INTERSTATE AIR QUALITY AGENCIES OR COMMISSIONS

SEC. 106. For the purpose of developing implementation plans for any interstate air quality control region designated pursuant to section 107, the Administrator is authorized to pay, for two years, up to 100 per centum of the air quality planning program costs of any agency designated by the Governors of the affected States, which agency shall be capable of recommending to the Governors plans for implementation of national primary and secondary ambient air quality standards and shall include representation from the States and appropriate political subdivisions within the air quality control region. After the initial two-year period the Administrator is authorized to make grants to such agency in an amount up to three-fourths of the air quality planning program costs of such agency.

AIR QUALITY CONTROL REGIONS

SEC. 107. (a) Each State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State by submitting an implementation plan for such State which will specify the manner in which national primary and secondary ambient air quality standards will be achieved and maintained within each air quality control region in such State.

(b) For purposes of developing and carrying out implementation plans under section 110—

(1) an air quality control region designated under this section before the date of enactment of the Clean Air Amendments of 1970, or a region designated after such date under subsection (c), shall be an air quality control region; and

(2) the portion of such State which is not part of any such designated region shall be an air quality control region, but such portion may be subdivided by the State into two or more air quality control regions with the approval of the Administrator.

(c) The Administrator shall, within 90 days after the date of enactment of the Clean Air Amendments of 1970, after consultation with appropriate State and local authorities, designate as an air quality control region any interstate area or major intrastate area which he deems necessary or appropriate for the attainment and maintenance of ambient air quality standards. The Administrator shall immediately notify the Governors of the affected States of any designation made under this subsection.

(d) (1) For the purpose of transportation control planning, part D (relating to nonattainment), part C (relating to prevention of significant deterioration of air quality), and for other purposes, each State, within one hundred and twenty days after the date of enactment of the Clean Air Act Amendments of 1977, shall submit to the Administrator a list, together with a summary of the available information, identifying those air quality control regions, or portions thereof, established pursuant to this section in such State which on the date of enactment of the Clean Air Act Amendments of 1977—

(A) do not meet a national primary ambient air quality standard for any air pollutant other than sulfur dioxide or particulate matter;

(B) do not meet, or in the judgment of the State may not in the time period required by an applicable implementation plan attain or maintain, any national primary ambient air quality standard for sulfur dioxide or particulate matter;

(C) do not meet a national secondary ambient air quality standard;

(D) cannot be classified under subparagraph (B) or (C) of this paragraph on the basis of available information, for ambient air quality levels for sulfur oxides or particulate matter; or

(E) have ambient air quality levels better than any national primary or secondary air quality standard other than for sulfur dioxide or particulate matter, or for which there is not sufficient data to be classified under subparagraph (A) or (C) of this paragraph.

(2) Not later than sixty days after submittal of the list under paragraph (1) of this subsection the Administrator shall promulgate each such list with such modifications as he deems necessary. Whenever the Administrator proposes to modify a list submitted by a State, he shall notify the State and request all available data relating to such region or portion, and provide such State with an opportunity to demonstrate why any proposed modification is inappropriate.

(4) Any region or portion thereof which is not classified under subparagraph (B) or (C) of paragraph (1) of this subsection for sulfur dioxide or particulate matter within one hundred and eighty days after enactment of the Clean Air Act Amendments of 1977 shall be deemed to be a region classified under subparagraph (D) of paragraph (1) of this subsection.[2]

(5) A State may from time to time review, and as appropriate revise and resubmit, the list required under this subsection. The Administrator shall consider and promulgate such revised list in accordance with this subsection.

(e) (1) Except as otherwise provided in paragraph (2), the Governor of each State is authorized, with the approval of the Administrator, to redesignate from time to time the air quality control regions within such State for purposes of efficient and effective air quality management. Upon such redesignation, the list under subsection (d) shall be modified accordingly.

(2) In the case of an air quality control region in a State, or part of such region, which the Administrator finds may significantly affect air pollution concentrations in another State, the Governor of the State in which such region, or part of a region, is located may redesignate from time to time the boundaries of so much of such air quality control region as is located within such State only with the approval of the Administrator and with the consent of all Governors of all States which the Administrator determines may be significantly affected.

(3) No compliance date extension granted under section 113(d)(5) (relating to coal conversion) shall cease to be effective by reason of the regional limitation pro-

[2] This paragraph was apparently intended to be numbered paragraph (3). See section 103 of Public Law 95-95.

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vided in section 113(d)(5) if the violation of such limitation is due solely to a redesignation of a region under this subsection.

AIR QUALITY CRITERIA AND CONTROL TECHNIQUES

SEC. 108. (a)(1) For the purpose of establishing national primary and secondary ambient air quality standards, the Administrator shall within 30 days after the date of enactment of the Clean Air Amendments of 1970 publish, and shall from time to time thereafter revise, a list which includes each air pollutant—

(A) emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare;

(B) the presence of which in the ambient air results from numerous or diverse mobile or stationary sources; and

(C) for which air quality criteria had not been issued before the date of enactment of the Clean Air Amendments of 1970, but for which he plans to issue air quality criteria under this section.

(2) The Administrator shall issue air quality criteria for an air pollutant within 12 months after he has included such pollutant in a list under paragraph (1). Air quality criteria for an air pollutant shall accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities. The criteria for an air pollutant, to the extent practicable, shall include information on—

(A) those variable factors (including atmospheric conditions) which of themselves or in combination with other factors may alter the effects on public health or welfare of such air pollutant;

(B) the types of air pollutants which, when present in the atmosphere, may interact with such pollutant to produce an adverse effect on public health or welfare; and

(C) any known or anticipated adverse effects on welfare.

(b)(1) Simultaneously with the issuance of criteria under subsection (a), the Administrator shall, after consultation with appropriate advisory committees and Federal departments and agencies, issue to the States and appropriate air pollution control agencies information on air pollution control techniques, which information shall include data relating to the cost of installation and operation, energy requirements, emission reduction benefits, and environmental impact of the emission control technology. Such information shall include such data as are

available on available technology and alternative methods of prevention and control of air pollution. Such information shall also include data on alternative fuels, processes, and operating methods which will result in elimination or significant reduction of emissions.

(2) In order to assist in the development of information on pollution control techniques, the Administrator may establish a standing consulting committee for each air pollutant included in a list published pursuant to subsection (a)(1), which shall be comprised of technically qualified individuals representative of State and local governments, industry, and the economic community. Each such committee shall submit, as appropriate, to the Administrator information related to that required by paragraph (1).

(c) The Administrator shall from time to time review, and, as appropriate, modify, and reissue any criteria or information on control techniques issued pursuant to this section. Not later than six months after the date of the enactment of the Clean Air Act Amendments of 1977, the Administrator shall revise and reissue criteria relating to concentrations of NO_2 over such period (not more than three hours) as he deems appropriate. Such criteria shall include a discussion of nitric and nitrous acids, nitrites, nitrates, nitrosamines, and other carcinogenic and potentially carcinogenic derivatives of oxides of nitrogen.

(d) The issuance of air quality criteria and information on air pollution control techniques shall be announced in the Federal Register and copies shall be made available to the general public.

(e) The Administrator shall, after consultation with the Secretary of Transportation and the Secretary of Housing and Urban Development and State and local officials and within 180 days after the enactment of this subsection, and from time to time thereafter, publish guidelines on the basic program elements for the planning process assisted under section 175 of part D. Such guidelines shall include information on—

(1) methods to identify and evaluate alternative planning and control activities;

(2) methods of reviewing plans on a regular basis as conditions change or new information is presented;

(3) identification of funds and other resources necessary to implement the plan, including interagency agreements on providing such funds and resources;

(4) methods to assure participation by the public in all phases of the planning process; and

(5) such other methods as the Administrator determines necessary to carry out a continuous planning process.

(f)(1) The Administrator shall publish and make available to appropriate Federal agencies, States, and air pollution control agencies, including agencies assisted under section 175 within 6 months after enactment of this subsection for clauses (i), (ii), (iii), and (iv) of subparagraph (A) and within one year after the enactment of this subsection for the balance of this subsection (and from time to time thereafter),

(A) information, prepared, as appropriate, in cooperation with the Secretary of Transportation, regarding processes, procedures, and methods to reduce or control each such pollutant, including but not limited to—

(i) motor vehicle emission inspection and maintenance programs;

(ii) programs to control vapor emissions from fuel transfer and storage operations and operations using solvents;

(iii) programs for improved public transit;

(iv) programs to establish exclusive bus and carpool lanes and areawide carpool programs:

(v) programs to limit portions of road surfaces or certain sections of the metropolitan areas to the use of common carriers, both as to time and place;

(vi) programs for long-range transit improvements involving new transportation policies and transportation facilities or major changes in existing facilities;

(vii) programs to control on-street parking:

(viii) programs to construct new parking facilities and operate existing parking facilities for the purpose of park and ride lots and fringe parking;

(ix) programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of nonmotorized vehicles or pedestrian use, both as to time and place;

(x) provisions for employer participation in programs to encourage carpooling, vanpooling, mass transit, bicycling, and walking;

(xi) programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;

(xii) programs of staggered hours of work;

(xiii) programs to institute road user charges, tolls, or differential rates to discourage single occupancy automobile trips;

(xiv) programs to control extended idling of vehicles;

(xv) programs to reduce emissions by improvements in traffic flow;

(xvi) programs for the conversion of fleet vehicles to cleaner engines or fuels, or to otherwise control fleet vehicle operations;

(xvii) programs for retrofit of emission devices or controls on vehicles and engines, other than light duty vehicles, not subject to regulations under section 202 of title II of this Act; and

(xviii) programs to reduce motor vehicle emissions which are caused by extreme cold start conditions;

(B) information on additional methods or strategies that will contribute to the reduction of mobile source related pollutants during periods in which any primary ambient air quality standard will be exceeded and during episodes for which an air pollution alert, warning, or emergency has been declared;

(C) information on other measures which may be employed to reduce the impact on public health or protect the health of sensitive or susceptible individuals or groups; and

(D) information on the extent to which any process, procedure, or method to reduce or control such air pollutant may cause an increase in the emissions or formation of any other pollutant.

(2) In publishing such information the Administrator shall also include an assessment of—

(A) the relative effectiveness of such processes, procedures, and methods;

(B) the potential effect of such processes, procedures, and methods on transportation system and the provision of transportation services; and

(C) the environmental, energy, and economic impact of such processes, procedures, and methods.

NATIONAL AMBIENT AIR QUALITY STANDARDS

SEC. 109. (a)(1) The Administrator—

(A) within 30 days after the date of enactment of the Clean Air Amendments of 1970, shall publish proposed regulations prescribing a national primary ambient air quality standard and a national secondary ambient air quality standard for each air pollutant for which air quality criteria have been issued prior to such date of enactment; and

(B) after a reasonable time for interested persons to submit written comments thereon (but no later than 90 days after the initial publication of such proposed standards) shall by regulation promulgate such proposed national primary and secondary ambient air quality standards with such modifications as he deems appropriate.

(2) With respect to any air pollutant for which air quality criteria are issued after the date of enactment of the Clean Air Amendments of 1970, the Administrator shall publish, simultaneously with the issuance of such criteria and information, proposed national primary and secondary ambient air quality standards for any such pollutant. The procedure provided for in paragraph (1)(B) of this subsection shall apply to the promulgation of such standards.

(b)(1) National primary ambient air quality standards, prescribed, under subsection (a) shall be ambient air quality standards the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health. Such primary standards may be revised in the same manner as promulgated.

(2) Any national secondary ambient air quality standard prescribed, under subsection (a) shall specify a level of air quality the attainment and maintenance of which in the judgment of the Administrator, based on such criteria, is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air. Such secondary standards may be revised in the same manner as promulgated.

(c) The Administrator shall, not later than one year after the date of the enactment of the Clean Air Act Amendments of 1977, promulgate a national primary ambient air quality standard for NO_2 concentrations over a period of not more than 3 hours unless, based on the criteria issued under section 108(c), he finds that there is no significant evidence that such a standard for such a period is requisite to protect public health.

(d)(1) Not later than December 31, 1980, and at five-year intervals thereafter, the Administrator shall complete a thorough review of the criteria published under section 108 and the national ambient air quality standards promulgated under this section and shall make such revisions in such criteria and standards and promulgate such new standards as may be appropriate in accordance with section 108 and subsection (b) of this section. The Administrator may review and revise criteria or promulgate new standards earlier or more frequently than required under this paragraph.

(2)(A) The Administrator shall appoint an independent scientific review committee composed of seven members including at least one member of the National Academy of Sciences, one physician, and one person representing State air pollution control agencies.

(B) Not later than January 1, 1980, and at five-year intervals thereafter, the committee referred to in subparagraph (A) shall complete a review of the criteria

published under section 108 and the national primary and secondary ambient air quality standards promulgated under this section and shall recommend to the Administrator any new national ambient air quality standards and revisions of existing criteria and standards as may be appropriate under section 108 and subsection (b) of this section.

(C) Such committee shall also (i) advise the Administrator of areas in which additional knowledge is required to appraise the adequacy and basis of existing, new, or revised national ambient air quality standards, (ii) describe the research efforts necessary to provide the required information, (iii) advise the Administrator on the relative contribution to air pollution concentrations of natural as well as anthropogenic activity, and (iv) advise the Administrator of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for attainment and maintenance of such national ambient air quality standards.

IMPLEMENTATION PLANS

SEC. 110. (a)(1) Each State shall, after reasonable notice and public hearings, adopt and submit to the Administrator, within nine months after the promulgation of a national primary ambient air quality standard (or any revision thereof) under section 109 for any air pollutant, a plan which provides for implementation, maintenance, and enforcement of such primary standard in each air quality control region (or portion thereof) within such State. In addition, such State shall adopt and submit to the Administrator (either as a part of a plan submitted under the preceding sentence or separately) within nine months after the promulgation of a national ambient air quality secondary standard (or revision thereof), a plan which provides for implementation, maintenance, and enforcement of such secondary standard in each air quality control region (or portion thereof) within such State. Unless a separate public hearing is provided, each State shall consider its plan implementing such secondary standard at the hearing required by the first sentence of this paragraph.

(2) The Administrator shall, within four months after the date required for submission of a plan under paragraph (1), approve or disapprove such plan for each portion thereof. The Administrator shall approve such plan, or any portion thereof, if he determines that it was adopted after reasonable notice and hearing and that—

(A) except as may be provided in subparagraph (I)(i) in the case of a plan implementing a national primary ambient air quality standard, it pro-

vides for the attainment of such primary standard as expeditiously as practicable but (subject to subsection (e)) in no case later than three years from the date of approval of such plan (or any revision thereof to take account of a revised primary standard); and (ii) in the case of a plan implementing a national secondary ambient air quality standard, it specifies a reasonable time at which such secondary standard will be attained;

(B) it includes emission limitations, schedules, and timetables for compliance with such limitations, and such other measures as may be necessary to insure attainment and maintenance of such primary or secondary standard, including, but not limited to transportation controls, air quality maintenance plans, and preconstruction review of direct sources of air pollution as provided in subparagraph (D);

(C) it includes provision for establishment and operation of appropriate devices, methods, systems, and procedures necessary to (i) monitor, compile, and analyze data on ambient air quality and, (ii) upon request, make such data available to the Administrator;

(D) it includes a program to provide for the enforcement of emission limitations and regulation of the modification, construction, and operation of any stationary source, including a permit program as required in parts C and D and a permit or equivalent program for any major emitting facility, within such region as necessary to assure (i) that national ambient air quality standards are achieved and maintained, and (ii) a procedure, meeting the requirements of paragraph (4), for review (prior to construction or modification) of the location of new sources to which a standard of performance will apply;

(E) it contains adequate provisions (i) prohibiting any stationary source within the State from emitting any air pollutant in amounts which will (I) prevent attainment or maintenance by any other State of any such national primary or secondary ambient air quality standard, or (II) interfere with measures required to be included in the applicable implementation plan for any other State under part C to prevent significant deterioration of air quality or to protect visibility, and (ii) insuring compliance with the requirements of section 126, relating to interstate pollution abatement;

(F) it provides (i) necessary assurances that the State will have adequate personnel, funding, and authority to carry out such implementation plan, (ii) requirements for installation of equipment by owners or operators of stationary sources to monitor

emissions from such sources, (iii) for periodic reports on the nature and amounts of such emissions; (iv) that such reports shall be correlated by the State agency with any emission limitations or standards established pursuant to this Act, which reports shall be available at reasonable times for public inspection; (v) for authority comparable to that in section 303, and adequate contingency plans to implement such authority; and (vi) requirements that the State comply with the requirements respecting State boards under section 128;

(G) it provides, to the extent necessary and practicable, for periodic inspection and testing of motor vehicles to enforce compliance with applicable emission standards;

(H) it provides for revision, after public hearing, of such plan (i) from time to time as may be necessary to take account of revisions of such national primary or secondary ambient air quality standard or the availability of improved or more expeditious methods of achieving such primary or secondary standard; or (ii) except as provided in paragraph (3)(C), whenever the Administrator finds on the basis of information available to him that the plan is substantially inadequate to achieve the national ambient air quality primary or secondary standard which it implements or to otherwise comply with any additional requirements established under the Clean Air Act Amendments of 1977;

(I) it provides that after June 30, 1979, no major stationary source shall be constructed or modified in any nonattainment area (as defined in section 171 (2)) to which such plan applies, if the emissions from such facility will cause or contribute to concentrations of any pollutant for which a national ambient air quality standard is exceeded in such area, unless, as of the time of application for a permit for such construction or modification, such plan meets the requirements of part D (relating to nonattainment areas);

(J) it meets the requirements of section 121 (relating to consultation), section 127 (relating to public notification), part C (relating to prevention of significant deterioration of air quality and visability protection); and

(K) it requires the owner or operator of each major stationary source to pay to the permitting authority as a condition of any permit required under this Act a fee sufficient to cover—

(i) the reasonable costs of reviewing and acting upon any application for such a permit, and

(ii) if the owner or operator receives a permit for such source, whether before or after the date of enactment of this subparagraph, the reasonable costs (incurred after such date of enactment) of implementing and enforcing the terms and conditions of any such permit (not including any court costs or other costs associated with any enforcement action).

(3)(A) The Administrator shall approve revision of any implementation plan applicable to an air quality control region if he determines that it meets the requirements of paragraph (2) and has been adopted by the State after reasonable notice and public hearings.

(B) As soon as practicable, the Administrator shall, consistent with the purposes of this Act and the Energy Supply and Environmental Coordination Act of 1974, review each State's applicable implementation plans and report to the State on whether such plans can be revised in relation to fuel burning stationary sources (or persons supplying fuel to such sources) without interfering with the attainment and maintenance of any national ambient air quality standard within the period permitted in this section. It the Administrator determines that any such plan can be revised, he shall notify the State that a plan revision may be submitted by the State. Any plan revision which is submitted by the State shall, after public notice and opportunity for public hearing, be approved by the Administrator if the revision relates only to fuel burning stationary sources (or persons supplying fuel to such sources), and the plan as revised complies with paragraph (2) of this subsection. The Administrator shall approve or disapprove any revision no later than three months after its submission.

(C) Neither the State, in the case of a plan (or portion thereof) approved under this subsection, nor the Administrator in the case of a plan (or portion thereof) promulgated under subsection (c), shall be required to revise an applicable implementation plan because one or more exemptions under section 118 (relating to Federal facilities), enforcement orders under section 113(d), suspensions under section 110(f) or (g) (relating to temporary energy or economic authority) or orders under section 119 (relating to primary nonferrous smelters) have been granted, if such plan would have met the requirements of this section if no such exemptions, orders, extension, or variances had been granted.

(D) Any applicable implementation plan for which an attainment date later than December 31, 1982, is provided pursuant to section 172(a)(2) shall be revised by July 1, 1979, to include the comprehensive measures and requirements referred to in subsection (c)(5)(B).

(4) The procedure referred to in paragraph (2)(D) for review, prior to construction or modification, of the location of new sources shall (A) provide for adequate authority to prevent the construction or modification of any new source to which a standard of performance under section 111 will apply at any location which the State determines will prevent the attainment or maintenance within any air quality control region (or portion thereof) within such State of a national ambient air quality primary or secondary standard, and (B) require that prior to commencing construction or modification of any such source, the owner or operator thereof shall submit to such State such information as may be necessary to permit the State to make a determination under clause (A).

(5)(A)(i) Any State may include in a State implementation plan, but the Administrator may not require as a condition of approval of such plan under this section, any indirect source review program. The Administrator may approve and enforce, as part of an applicable implementation plan, an indirect source review program which the State chooses to adopt and submit as part of its plan.

(ii) Except as provided in subparagraph (B), no plan promulgated by the Administrator shall include any indirect source review program for any air quality control region, or portion thereof.

(iii) Any State may revise an applicable implementation plan approved under section 110(a) to suspend or revoke any such program included in such plan, provided that such plan meets the requirements of this section.

(B) The Administrator shall have the authority to promulgate, implement and enforce regulations under section 110(c) respecting indirect source review programs which apply only to federally assisted highways, airports, and other major federally assisted indirect sources and federally owned or operated indirect sources.

(C) For purposes of this paragraph, the term "indirect source" means a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution. Such term includes parking lots, parking garages, and other facilities subject to any measure for management of parking supply (within the meaning of section 110(c)(2)(D)(ii)), including regulation of existing off-street parking but such term does not include new or existing on-street parking. Direct emissions sources or facilities at, within, or associated with, any indirect source shall not be deemed indirect sources for the purpose of this paragraph.

(D) For purposes of this paragraph the term "indirect source review program" means the facility-by-facility review of indirect sources of air pollution,

including such measures as are necessary to assure, or assist in assuring, that a new or modified indirect source will not attract mobile sources of air pollution, the emissions from which would cause or contribute to air pollution concentrations—

(i) exceeding any national primary ambient air quality standard for a mobile source-related air pollutant after the primary standard attainment date, or

(ii) preventing maintenance of any such standard after such date.

(E) For purposes of this paragraph and paragraph (2)(B), the term "transportation control measure" does not include any measure which is an "indirect source review program."

(6) No State plan shall be treated as meeting the requirements of this section unless such plan provides that in the case of any source which uses a supplemental, or intermittent control system for purposes of meeting the requirements of an order under section 113(d) or section 119 (relating to primary nonferrous smelter orders), the owner or operator of such source may not temporarily reduce the pay of any employee by reason of the use of such supplemental or intermittent or other dispersion dependent control system.

(b) The Administrator may, wherever he determines necessary, extend the period for submission of any plan or portion thereof which implements a national secondary ambient air-quality standard for a period not to exceed eighteen months from the date otherwise required for submission of such plan.

(c)(1) The Administrator shall, after consideration of any State hearing record, promptly prepare and publish proposed regulations setting forth an implementation plan, or portion thereof, for a State if—

(A) the State fails to submit an implementation plan which meets the requirements of this section,

(B) the plan, or any portion thereof, submitted for such State is determined by the Administrator not to be in accordance with the requirements of this section, or

(C) the State fails, within 60 days after notification by the Administrator or such longer period as he may prescribe, to revise an implementation plan as required pursuant to a provision of its plan referred to in subsection (a)(2)(H).

If such State held no public hearing associated with respect to such plan (or revision thereof), the Administrator shall provide opportunity for such hearing within such State on any proposed regulation. The Administrator shall, within six months after the date required for submission of such plan (or revision thereof), promulgate any such regulations unless, prior to such promulgation, such State has adopted and submitted a plan (or revision) which the Administrator determines to be in accordance with the requirements of this section. Notwithstanding the preceding sentence, any portion of a plan relating to any measure described in the first sentence of section 121 (relating to consultation) or the consultation process required under such section 121 shall not be required to be promulgated before the date eight months after such date required for submission.

(2)(A) The Administrator shall conduct a study and shall submit a report to the Committee on Interstate and Foreign Commerce of the United States House of Representatives and the Committee on Public Works of the United States Senate not later than three months after date of enactment of this paragraph on the necessity of parking surcharge, management of parking supply, and preferential bus/carpool lane regulations as part of the applicable implementation plans required under this section to achieve and maintain national primary ambient air quality standards. The study shall include an assessment of the economic impact of such regulations, consideration of alternative means of reducing total vehicle miles traveled, and an assessment of the impact of such regulations on other Federal and State programs dealing with energy or transportation. In the course of such study, the Administrator shall consult with other Federal officials including, but not limited to, the Secretary of Transportation, the Federal Energy Administrator, and the Chairman of the Council on Environmental Quality.

(B) No parking surcharge regulation may be required by the Administrator under paragraph (1) of this subsection as a part of an applicable implementation plan. All parking surcharge regulations previously required by the Administrator shall be void upon the date of enactment of this subparagraph. This subparagraph shall not prevent the Administrator from approving parking surcharges if they are adopted and submitted by a State as part of an applicable implementation plan. The Administrator may not condition approval of any implementation plan submitted by a State on such plan's including a parking surcharge regulation.

(C) The Administrator is authorized to suspend until January 1, 1975, the effective date or applicability of any regulations for the management of parking supply or any requirement that such regulations be a part of an applicable implementation plan approved or promulgated under this section. The exercise of the authority under this subparagraph shall not prevent the Administrator from approving such regulations if they are adopted and submitted by a State as part of an applicable implementation plan. If the Administrator exer-

cises the authority under this subparagraph, regulations requiring a review or analysis of the impact of proposed parking facilities before construction which take effect on or after January 1, 1975, shall not apply to parking facilities on which construction has been initiated before January 1, 1975.

(D) For purposes of this pargaraph—

(i) The term "parking surcharge regulation" means a regulation imposing or requiring the imposition of any tax, surcharge, fee, or other charge on parking spaces, or any other area used for the temporary storage of motor vehicles.

(ii) The term "management of parking supply" shall include any requirement providing that any new facility containing a given number of parking spaces shall receive a permit or other prior approval, issuance of which is to be conditioned on air quality considerations.

(iii) The term "preferential bus/carpool lane" shall include any requirement for the setting aside of one or more lanes of a street or highway on a permanent or temporary basis for the exclusive use of buses or carpools, or both.

(E) No standard, plan, or requirement, relating to management of parking supply or preferential bus/carpool lanes shall be promulgated after the date of enactment of this paragraph by the Administrator pursuant to this section, unless such promulgation has been subjected to at least one public hearing which has been held in the area affected and for which reasonable notice has been given in such area. If substantial changes are made following public hearings, one or more additional hearings shall be held in such area after such notice.

(3) Upon application of the chief executive officer of any general purpose unit of local government, if the Administrator determines that such unit has adequate authority under State or local law, the Administrator may delegate to such unit the authority to implement and enforce within the jurisdiction of such unit any part of a plan promulgated under this subsection. Nothing in this paragraph shall prevent the Administrator from implementing or enforcing any applicable provision of a plan promulgated under this subsection.

(4) In the case of any applicable implementation plan containing measures requiring—

(A) retrofits on other than commercially owned in-use vehicles,

(B) gas rationing which the Administrator finds would have seriously disruptive and widespread economic or social effects, or

(C) the reduction of the supply of on-street parking spaces,

the Governor of the State may, after notice and opportunity for public hearing, temporarily suspend such measures notwithstanding the requirements of this section until January 1, 1979, or the date on which a plan revision under section 110(a)(2)(I) is submitted, whichever is earlier. No such suspension shall be granted unless the State agrees to prepare, adopt, and submit such plan revision as determined by the Administrator.

(5) (A) Any measure in an applicable implementation plan which requires a toll or other charge for the use of a bridge located entirely within one city shall be eliminated from such plan by the Administrator upon application by the Governor of the State, which application shall include a certification by the Governor that he will revise such plan in accordance with subparagraph (B).

(B) In the case of any applicable implementation plan with respect to which a measure has been eliminated under subparagraph (A), such plan shall, not later than one year after the date of the enactment of this subparagraph, be revised to include comprehensive measures (including the written evidence required by part D), to:

(i) establish, expand, or improve public transportation measures to meet basic transportation needs, as expeditiously as is practicable; and

(ii) implement transportation control measures necessary to attain and maintain national ambient air quality standards,

and such revised plan shall, for the purpose of implementing such comprehensive public transportation measures, include requirements to use (insofar as is necessary) Federal grants, State or local funds, or any combination of such grants and funds as may be consistent with the terms of the legislation providing such grants and funds. Such measures shall, as a substitute for the tolls or charges eliminated under subparagraph (A), provide for emissions reductions equivalent to the reductions which may reasonably be expected to be achieved through the use of the tolls or charges eliminated.

(C) Any revision of any implementation plan for purposes of meeting the requirements of subparagraph (B) shall be submitted in coordination with any plan revision required under part D.

(d) For purposes of this Act, an applicable implementation plan is the implementation plan, or most recent revision thereof, which has been approved under subsection (a) or promulgated under subsection (c) and which implements the requirements of this section.

(e)(1) Upon application of a Governor of a State at the time of submission of any plan implementing a national ambient air quality primary standard, the Administrator may (subject to paragraph (2)) extend the three-year period referred to in subsection (a)(2)(A)

(i) for not more than two years for an air quality control region if after review of such plan the Administrator determines that—

(A) one or more emission sources (or classes of moving sources) are unable to comply with the requirements of such plan which implement such primary standard because the necessary technology or other alternatives are not available or will not be available soon enough to permit compliance within such three-year period, and

(B) the State has considered and applied as a part of its plan reasonably available alternative means of attaining such primary standard and has justifiably concluded that attainment of such primary standard within the three years cannot be achieved.

(2) The Administrator may grant an extension under paragraph (1) only if he determines that the State plan provides for—

(A) application of the requirements of the plan which implement such primary standard to all emission sources in such region other than the sources (or classes) described in paragraph (1)(A) within the three-year period, and

(B) such interim measures of control of the sources (or classes) described in paragraph (1)(A) as the Administrator determines to be reasonable under the circumstances.

(f)(1) Upon application by the owner or operator of a fuel burning stationary source, and after notice and opportunity for public hearing, the Governor of the State in which such source is located may petition the President to determine that a national or regional energy emergency exists of such severity that—

(A) a temporary suspension of any part of the applicable implementation plan may be necessary, and

(B) other means of responding to the energy emergency may be inadequate.

Such determination shall not be delegable by the President to any other person. If the President determines that a national or regional energy emergency of such severity exists, a temporary emergency suspension of any part of an applicable implementation plan adopted by the State may be issued by the Governor of any State covered by the President's determination under the condition specified in paragraph (2) and may take effect immediately.

(2) A temporary emergency suspension under this subsection shall be issued to a source only if the Governor of such State finds that—

(A) there exists in the vicinity of such source a temporary energy emergency involving high levels of unemployment or loss of necessary energy supplies for residential dwellings; and

(B) such unemployment or loss can be totally or partially alleviated by such emergency suspension.

Not more than one such suspension may be issued for any source on the basis of the same set of circumstances or on the basis of the same emergency.

(3) A temporary emergency suspension issued by a Governor under this subsection shall remain in effect for a maximum of four months or such lesser period as may be specified in a disapproval order of the Administrator, if any. The Administrator may disapprove such suspension if he determines that it does not meet the requirements of paragraph (2).

(4) This subsection shall not apply in the case of a plan provision or requirement promulgated by the Administrator under subsection (c) of this section, but in any such case the President may grant a temporary emergency suspension for a four month period of any such provision or requirement if he makes the determinations and findings specified in paragraphs (1) and (2).

(5) The Governor may include in any temporary emergency suspension issued under this subsection a provision delaying for a period identical to the period of such suspension any compliance schedule (or increment of progress) to which such source is subject under section 119, as in effect before the date of the enactment of this paragraph or section 113(d) of this Act, upon a finding that such source is unable to comply with such schedule (or increment) solely because of the conditions on the basis of which a suspension was issued under this subsection.

(g)(1) In the case of any State which has adopted and submitted to the Administrator a proposed plan revision which the State determines—

(A) meets the requirements of this section, and

(B) is necessary (i) to prevent the closing for one year or more of any source of air pollution, and (ii) to prevent substantial increases in unemployment which would result from such closing, and

which the Administrator has not approved or disapproved under this section within the required four month period, the Governor may issue a temporary emergency suspension of the part of the applicable implementation plan for such State which is proposed to be revised with respect to such source. The determination under subparagraph (B) may not be made with respect to a source which would close without regard whether or not the proposed plan revision is approved.

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(2) A temporary emergency suspension issued by a Governor under this subsection shall remain in effect for a maximum of four months or such lesser period as may be specified in a disapproval order of the Administrator. The Administrator may disapprove such suspension if he determines that it does not meet the requirements of this subsection.

(3) The Governor may include in any temporary emergency suspension issued under this subsection a provision delaying for a period identical to the period of such suspension any compliance schedule (or increment of progress) to which such source is subject under section 119 as in effect before the date of the enactment of this paragraph, or under section 113(d) upon a finding that such source is unable to comply with such schedule (or increment) solely because of the conditions on the basis of which a suspension was issued under this subsection.

(h)(1) Not later than one year after the date of enactment of the Clean Air Act Amendments of 1977 and annually thereafter, the Administrator shall assemble and publish a comprehensive document for each State setting forth all requirements of the applicable implementation plan for such State and shall publish notice in the Federal Register of the availability of such documents. Each such document shall be revised as frequently as practicable but not less often than annually.

(2) The Administrator may promulgate such regulations as may be reasonably necessary to carry out the purpose of this subsection.

(i) Except for a primary nonferrous smelter order under section 119, a suspension under section 110 (f) or (g) (relating to emergency suspensions), an exemption under section 118 (relating to certain Federal facilities), an order under section 113(d) (relating to compliance orders), a plan promulgation under section 110(c), or a plan revision under section 110(a)(3), no order, suspension, plan revision, or other action modifying any requirement of an applicable implementation plan may be taken with respect to any stationary source by the State or by the Administrator.

(j) As a condition for issuance of any permit required under this title, the owner or operator of each new or modified stationary source which is required to obtain such a permit must show to the satisfaction of the permitting authority that the technological system of continuous emission reduction which is to be used will enable such source to comply with the standards of performance which are to apply to such source and that the construction or modification and operation of such source will be in compliance with all other requirements of this Act.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

SEC. 111. (a) For purposes of this section:

(1) The term "standard of performance" means—

(A) with respect to any air pollutant emitted from a category of fossil fuel fired stationary sources to which subsection (b) applies, a standard—

(i) establishing allowable emission limitations for such category of sources, and

(ii) requiring the achievement of a percentage reduction in the emissions from such category of sources from the emissions which would have resulted from the use of fuels which are not subject to treatment prior to combustion,

(B) with respect to any air pollutant emitted from a category of stationary sources (other than fossil fuel fired sources) to which subsection (b) applies, a standard such as that referred to in subparagraph (A)(i); and

(C) with respect to any air pollutant emitted from a particular source to which subsection (d) applies, a standard which the State (or the Administrator under the conditions specified in subsection (d)(2)) determines is applicable to that source and which reflects the degree of emission reduction achievable through the application of the best system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated for that category of sources.

For the purpose of subparagraphs (A)(i) and (ii) and (B), a standard of performance shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated. For the purpose of subparagraph (1)(A)(ii), any cleaning of the fuel or reduction in the pollution characteristics of the fuel after extraction and prior to combustion may be credited, as determined under regulations promulgated by the Administrator, to a source which burns such fuel.

(2) The term "new source" means any stationary source, the construction or modification of which is commenced after the publication of regulations (or,

if earlier, proposed regulations) prescribing a standard of performance under this section which will be applicable to such source.

(3) The term "stationary source" means any building, structure, facility, or installation which emits or may emit any air pollutant.

(4) The term "modification" means any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.

(5) The term "owner or operator" means any person who owns, leases, operates, controls, or supervises a stationary source.

(6) The term "existing source" means any stationary source other than a new source.

(7) The term "technological system of continuous emission reduction" means—

(A) a technological process for production or operation by any source which is inherently low-polluting or nonpolluting, or

(B) a technological system for continuous reduction of the pollution generated by a source before such pollution is emitted into the ambient air, including precombustion cleaning or treatment of fuels.

(8) A conversion to coal (A) by reason of an order under section 2(a) of the Energy Supply and Environmental Coordination Act of 1974 or any amendment thereto, or any subsequent enactment which supersedes such Act, or (B) which qualifies under section 113(d)(5)(A)(ii) of this Act, shall not be deemed to be a modification for purposes of paragraphs (2) and (4) of this subsection.

(b)(1)(A) The Administrator shall, within 90 days after the date of enactment of the Clean Air Amendments of 1970, publish (and from time to time thereafter shall revise) a list of categories of stationary sources. He shall include a category of sources in such list if in his judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.

(B) Within 120 days after the inclusion of a category of stationary sources in a list under subparagraph (A), the Administrator shall publish proposed regulations, establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within 90 days after such publication, such standards with such modifications as he deems appropriate. The Administrator shall, at least every four years, review and, if appropriate, revise such standards following the procedure required by this subsection for promulgation of such standards. Standards of performance or revisions thereof shall become effective upon promulgation.

(2) The Administrator may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards.

(3) The Administrator shall, from time to time, issue information on pollution control techniques for categories of new sources and air pollutants subject to the provisions of this section.

(4) The provisions of this section shall apply to any new source owned or operated by the United States.

(5) Except as otherwise authorized under subsection (h), nothing in this section shall be construed to require, or to authorize the Administrator to require, any new or modified source to install and operate any particular technological system of continuous emission reduction to comply with any new source standard of performance.

(6) The revised standards of performance required by enactment of subsection (a)(1)(A) (i) and (ii) shall be promulgated not later than one year after enactment of this paragraph. Any new or modified fossil fuel fired stationary source which commences construction prior to the date of publication of the proposed revised standards shall not be required to comply with such revised standards.

(c)(1) Each State may develop and submit to the Administrator a procedure for implementing and enforcing standards of performance for new sources located in such State. If the Administrator finds the State procedure is adequate, he shall delegate to such State any authority he has under this Act to implement and enforce such standards.

(2) Nothing in this subsection shall prohibit the Administrator from enforcing any applicable standard of performance under this section.

(d)(1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 110 under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 108(a) or 112(b)(1)(A) but (ii) to which a standard of performance under subsection (b) would apply if such existing source were a new source, and (B) provides for the implementation and enforcement of such standards of performance. Regulations of the Administrator under this paragraph shall permit the

State in applying a standard of performance to any particular source under a plan submitted under this paragraph to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies.

(2) The Administrator shall have the same authority—

(A) to prescribe a plan for a State in cases where the State fails to submit a satisfactory plan as he would have under section 110(c) in the case of failure to submit an implementation plan, and

(B) to enforce the provisions of such plan in cases where the State fails to enforce them as he would have under sections 113 and 114 with respect to an implementation plan. In promulgating a standard of performance under a plan prescribed under this paragraph, the Administrator shall take into consideration, among other factors, remaining useful lives of the sources in the category of sources to which such standard applies.

(e) After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source.

(f)(1) Not later than one year after the date of enactment of this subsection, the Administrator shall promulgate regulations listing under subsection (b)(1)(A) the categories of major stationary sources which are not on the date of the enactment of this subsection included on the list required under subsection (b)(1)(A). The Administrator shall promulgate regulations establishing standards of performance for the percentage of such categories of sources set forth in the following table before the expiration of the corresponding period set forth in such table:

Percentage of source categories required to be listed for which standards must be established:	Period by which standards must be promulgated after date list is required to be promulgated:
25	2 years.
75	3 years.
100	4 years.

(2) In determining priorities for promulgating standards for categories of major stationary sources for the purpose of paragraph (1), the Administrator shall consider—

(A) the quantity of air pollutant emissions which each such category will emit, or will be designed to emit;

(B) the extent to which each such pollutant may reasonably be anticipated to endanger public health or welfare; and

(C) the mobility and competitive nature of each such category of sources and the consequent need for nationally applicable new source standards of performance.

(3) Before promulgating any regulations under this subsection or listing any category of major stationary sources as required under this subsection, the Administrator shall consult with appropriate representatives of the Governors and of State air pollution control agencies.

(g)(1) Upon application by the Governor of a State showing that the Administrator has failed to specify in regulations under subsection (f)(1) any category of major stationary sources required to be specified under such regulations, the Administrator shall revise such regulations, to specify any such category.

(2) Upon application of the Governor of a State, showing that any category of stationary sources which is not included in the list under subsection (b)(1)(A) contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare (notwithstanding that such category is not a category of major stationary sources), the Administrator shall revise such regulations to specify such category of stationary sources.

(3) Upon application of the Governor of a State showing that the Administrator has failed to apply properly the criteria required to be considered under subsection (f)(2), the Administrator shall revise the list under subsection (b)(1)(A) to apply properly such criteria.

(4) Upon application of the Governor of a State showing that—

(A) a new, innovative, or improved technology or process which achieves greater continuous emission reduction has been adequately demonstrated for any category of stationary sources, and

(B) as a result of such technology or process, the new source standard of performance in effect under subsection (b) for such category no longer reflects the greatest degree of emission limitation achievable through application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impact and energy requirements) has been adequately demonstrated,

the Administrator shall revise such standard of performance for such category accordingly.

(5) Upon application by the Governor of a State showing that the Administrator has failed to list any air pollutant which causes, or contributes to, air pollution which

may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness as a hazardous air pollutant under section 112, the Administrator shall revise the list of hazardous air pollutants under such section to include such pollutant.

(6) Upon application by the Governor of a State showing that any category of stationary sources of a hazardous air pollutant listed under section 112 is not subject to emission standards under such section, the Administrator shall propose and promulgate such emission standards applicable to such category of sources.

(7) Unless later deadlines for action of the Administrator are otherwise prescribed under this section or section 112, the Administrator shall, not later than three months following the date of receipt of any application by a Governor of a State, either—

(A) find that such application does not contain the requisite showing and deny such application, or

(B) grant such application and take the action required under this subsection.

(8) Before taking any action required by subsection (f) or by this subsection, the Administrator shall provide notice and opportunity for public hearing.

(h)(1) For purposes of this section, if in the judgment of the Administrator, it is not feasible to prescribe or enforce a standard of performance, he may instead promulgate a design, equipment, work practice, or operational standard, or combination thereof, which reflects the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated. In the event the Administrator promulgates a design or equipment standard under this subsection, he shall include as part of such standard such requirements as will assure the proper operation and maintenance of any such element of design or equipment.

(2) For the purpose of this subsection, the phrase "not feasible to prescribe or enforce a standard of performance" means any situation in which the Administrator determines that (A) a pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State, or local law, or (B) the application of measurement methodology to a particular class of sources is not practicable due to technological or economic limitations.

(3) If after notice and opportunity for public hearing, any person establishes to the satisfaction of the Administrator that an alternative means of emission limitation will achieve a reduction in emissions of any air pollutant at least equivalent to the reduction in emissions of such air pollutant achieved under the requirements of paragraph (1), the Administrator shall permit the use of such alternative by the source for purposes of compliance with this section with respect to such pollutant.

(4) Any standard promulgated under paragraph (1) shall be promulgated in terms of standard of performance whenever it becomes feasible to promulgate and enforce such standard in such terms.

(i) Any regulations promulgated by the Administrator under this section applicable to grain elevators shall not apply to country elevators (as defined by the Administrator) which have a storage capacity of less than two million five hundred thousand bushels.

(j)(1)(A) Any person proposing to own or operate a new source may request the Administrator for one or more waivers from the requirements of this section for such source or any portion thereof with respect to any air pollutant to encourage the use of an innovative technological system or systems of continuous emission reduction. The Administrator may, with the consent of the Governor of the State in which the source is to be located, grant a waiver under this paragraph, if the Administrator determines after notice and opportunity for public hearing, that—

(i) the proposed system or systems have not been adequately demonstrated,

(ii) the proposed system or systems will operate effectively and there is a substantial likelihood that such system or systems will achieve greater continuous emission reduction than that required to be achieved under the standards of performance which would otherwise apply, or achieve at least an equivalent reduction at lower cost in terms of energy, economic, or nonair quality environmental impact,

(iii) the owner or operator of the proposed source has demonstrated to the satisfaction of the Administrator that the proposed system will not cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation, function, or malfunction, and

(iv) the granting of such waiver is consistent with the requirements of subparagraph (C).

In making any determination under clause (ii), the Administrator shall take into account any previous failure of such system or systems to operate effectively or to meet any requirement of the new source performance standards. In determining whether an unreasonable risk exists under clause (iii), the Administrator shall consider, among other factors, whether and to what extent the

use of the proposed technological system will cause, increase, reduce, or eliminate emissions of any unregulated pollutants; available methods for reducing or eliminating any risk to public health, welfare, or safety which may be associated with the use of such system; and the availability of other technological systems which may be used to conform to standards under subsection (b) of this section without causing or contributing to such unreasonable risk. The Administrator may conduct such tests and may require the owner or operator of the proposed source to conduct such tests and provide such information as is necessary to carry out clause (iii) of this subparagraph. Such requirements shall include a requirement for prompt reporting of the emission of any unregulated pollutant from a system if such pollutant was not emitted, or was emitted in significantly lesser amounts without use of such system.

(B) A waiver under this paragraph shall be granted on such terms and conditions as the Administrator determines to be necessary to assure—

(i) emissions from the source will not prevent attainment and maintenance of any national ambient air quality standards, and

(ii) proper functioning of the technological system or systems authorized.

Any such term or condition shall be treated as a standard of performance for the purposes of subsection (e) of this section and section 113.

(C) The number of waivers granted under this paragraph with respect to a proposed technological system of continuous emission reduction shall not exceed such number as the Administrator finds necessary to ascertain whether or not such system will achieve the conditions specified in clauses (ii) and (iii) of subparagraph (A).

(D) A waiver under this paragraph shall extend to the sooner of—

(i) the date determined by the Administrator, after consultation with the owner or operator of the source, taking into consideration the design, installation, and capital cost of the technological system or systems being used, or

(ii) the date on which the Administrator determines that such system has failed to—

(I) achieve at least an equivalent continuous emission reduction to that required to be achieved under the standards of performance which would otherwise apply, or

(II) comply with the condition specified in paragraph (1)(A)(iii),

and that such failure cannot be corrected.

(E) In carrying out subparagraph (D)(i), the Administrator shall not permit any waiver for a source or portion thereof to extend beyond the date—

(i) seven years after the date on which any waiver is granted to such source or portion thereof, or

(ii) four years after the date on which such source or portion thereof commences operation,

whichever is earlier.

(F) No waiver under this subsection shall apply to any portion of a source other than the portion on which the innovative technological system or systems of continuous emission reduction is used.

(2)(A) If a waiver under paragraph (1) is terminated under clause (ii) of paragraph (1)(D), the Administrator shall grant an extension of the requirements of this section for such source for such minimum period as may be necessary to comply with the applicable standard of performance under subsection (b) of this section. Such period shall not extend beyond the date three years from the time such waiver is terminated.

(B) An extension granted under this paragraph shall set forth emission limits and a compliance schedule containing increments of progress which require compliance with the applicable standards of performance as expeditiously as practicable and include such measures as are necessary and practicable in the interim to minimize emissions. Such schedule shall be treated as a standard of performance for purposes of subsection (e) of this section and section 113.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

SEC. 112. (a) For purposes of this section—

(1) The term "hazardous air pollutant" means an air pollutant to which no ambient air quality standard is applicable and which in the judgment of the Administrator causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.

(2) The term "new source" means a stationary source the construction or modification of which is commenced after the Administrator proposes regulations under this section establishing an emission standard which will be applicable to such source.

(3) The terms "stationary source," "modification," "owner or operator" and "existing source" shall have the same meaning as such terms have under section 111(a).

(b)(1)(A) The Administrator shall, within 90 days after the date of enactment of the Clean Air Amendments of 1970, publish (and shall from time to time thereafter revise) a list which includes each hazardous air pollutant for which he intends to establish an emission standard under this section.

(B) Within 180 days after the inclusion of any air pollutant in such list, the Administrator shall publish proposed regulations establishing emission standards for such pollutant together with a notice of a public hearing within thirty days. Not later than 180 days after such publication, the Administrator shall prescribe an emission standard for such pollutant, unless he finds, on the basis of information presented at such hearings, that such pollutant clearly is not a hazardous air pollutant. The Administrator shall establish any such standard at the level which in his judgment provides an ample margin of safety to protect the public health from such hazardous air pollutant.

(C) Any emission standard established pursuant to this section shall become effective upon promulgation.

(2) The Administrator shall, from time to time, issue information on pollution control techniques for air pollutants subject to the provisions of this section.

(c) (1) After the effective date of any emission standard under this section—

(A) no person may construct any new source or modify any existing source which, in the Administrator's judgment, will emit an air pollutant to which such standard applies unless the Administrator finds that such source if properly operated will not cause emissions in violation of such standard, and

(B) no air pollutant to which such standard applies may be emitted from any stationary source in violation of such standard, except that in the case of an existing source—

(i) such standard shall not apply until 90 days after its effective date, and

(ii) the Administrator may grant a waiver permitting such source a period of up to two years after the effective date of a standard to comply with the standard, if he finds that such period is necessary for the installation of controls and that steps will be taken during the period of the waiver to assure that the health of persons will be protected from imminent endangerment.

(2) The President may exempt any stationary source from compliance with paragraph (1) for a period of not more than two years if he finds that the technology to implement such standards is not available and the operation of such source is required for reasons of national security. An exemption under this paragraph may be extended for one or more additional periods, each period not to exceed two years. The President shall make a report to Congress with respect to each exemption (or extension thereof) made under this paragraph.

(d) (1) Each State may develop and submit to the Administrator a procedure for implementing and enforcing emission standards for hazardous air pollutants for stationary sources located in such State. If the Administrator finds the State procedure is adequate, he shall delegate to such State any authority he has under this Act to implement and enforce such standards.

(2) Nothing in this subsection shall prohibit the Administrator from enforcing any applicable emission standard under this section.

(e) (1) For purposes of this section, if in the judgment of the Administrator, it is not feasible to prescribe or enforce an emission standard for control of a hazardous air pollutant or pollutants, he may instead promulgate a design, equipment, work practice, or operational standard, or combination thereof, which in his judgment is adequate to protect the public health from such pollutant or pollutants with an ample margin of safety. In the event the Administrator promulgates a design or equipment standard under this subsection, he shall include as part of such standard such requirements as will assure the proper operation and maintenance of any such element of design or equipment.

(2) For the purpose of this subsection, the phrase "not feasible to prescribe or enforce an emission standard" means any situation in which the Administrator determines that (A) a hazardous pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State, or local law, or (B) the application of measurement methodology to a particular class of sources is not practicable due to technological or economic limitations.

(3) If after notice and opportunity for public hearing, any person establishes to the satisfaction of the Administrator that an alternative means of emission limitation will achieve a reduction in emissions of any air pollutant at least equivalent to the reduction in emissions of such air pollutant achieved under the requirements of paragraph (1), the Administrator shall permit the use of such alternative by the source for purposes of compliance with this section with respect to such pollutant.

(4) Any standard promulgated under paragraph (1) shall be promulgated in terms of an emission standard whenever it becomes feasible to promulgate and enforce such standard in such terms.

FEDERAL ENFORCEMENT

SEC. 113. (a) (1) Whenever, on the basis of any information available to him, the Administrator finds that any person is in violation of any requirement of an applicable

implementation plan, the Administrator shall notify the person in violation of the plan and the State in which the plan applies of such finding. If such violation extends beyond the 30th day after the date of the Administrator's notification, the Administrator may issue an order requiring such person to comply with the requirements of such plan or he may bring a civil action in accordance with subsection (b).

(2) Whenever, on the basis of information available to him, the Administrator finds that violations of an applicable implementation plan are so widespread that such violations appear to result from a failure of the State in which the plan applies to enforce the plan effectively, he shall so notify the State. If the Administrator finds such failure extends beyond the thirtieth day after such notice, he shall give public notice of such finding. During the period beginning with such public notice and ending when such State satisfies the Administrator that it will enforce such plan (hereafter referred to in this section as "period of federally assumed enforcement"), the Administrator may enforce any requirement of such plan with respect to any person—

(A) by issuing an order to comply with such requirement, or

(B) by bringing a civil action under subsection (b).

(3) Whenever, on the basis of any information available to him, the Administrator finds that any person is in violation of section 111(e) (relating to new source performance standards), 112(c) (relating to standards for hazardous emissions), or 119(g) (relating to energy-related authorities), or is in violation of any requirement of section 114 (relating to inspections, etc.), he may issue an order requiring such person to comply with such section or requirement, or he may bring a civil action in accordance with subsection (b).

(4) An order issued under this subsection (other than an order relating to a violation of section 112) shall not take effect until the person to whom it is issued has had an opportunity to confer with the Administrator concerning the alleged violation. A copy of any order issued under this subsection shall be sent to the State air pollution control agency of any State in which the violation occurs. Any order issued under this subsection shall state with reasonable specificity the nature of the violation, specify a time for compliance which the Administrator determines is reasonable, taking into account the seriousness of the violation and any good faith efforts to comply with applicable requirements. In any case in which an order under this subsection (or notice to a violator under paragraph (1)) is issued to a corporation, a copy of such order (or notice) shall be issued to appropriate corporate officers.

(5) Whenever, on the basis of information available to him, the Administrator finds that a State is not acting in compliance with any requirement of the regulation referred to in section 129(a)(1) of the Clean Air Act Amendments of 1977 (relating to certain interpretative regulations) or any plan provisions required under section 110(a)(2)(I) and part D, he may issue an order prohibiting the construction or modification of any major stationary source in any area to which such provisions apply or he may bring a civil action under subsection (b)(5).

(b) The Administrator shall in the case of any person which is the owner or operator of a major stationary source, and may, in the case of any other person, commence a civil action for a permanent or temporary injunction, or to assess and recover a civil penalty of not more than $25,000 per day of violation, or both, whenever such person—

(1) violates or fails or refuses to comply with any order issued under subsection (a); or

(2) violates any requirement of an applicable implementation plan (A) during any period of Federally assumed enforcement, or (B) more than 30 days after having been notified by the Administration under subsection (a)(1) that such person is violating such requirement; or

(3) violates section 111(e),[3] 112(c), section 119(g) (as in effect before the date of the enactment of the Clean Air Act Amendments of 1977), subsection (d)(5) (relating to coal conversion), section 320 (relating to cost of certain vapor recovery), section 119 (relating to smelter orders), or any regulation under part B (relating to ozone); or

(4) fails or refuses to comply with any requirement of section 114 or subsection (d) of this section; or

(5) attempts to construct or modify a major stationary source in any area with respect to which a finding under subsection (a)(5) has been made.

The Administrator may commence a civil action for recovery of any noncompliance penalty under section 120 or for recovery of any nonpayment penalty for which any person is liable under section 120 or for both. Any action under this subsection may be brought in the district court of the United States for the district in which the violation occurred or in which the defendant resides or has his principal place of business, and such court shall have jurisdiction to restrain such violation, to require compliance, to assess such civil penalty and to collect any noncompliance penalty (and nonpayment penalty) owed under section 120. In determining the amount of any civil penalty to be assessed under this subsection, the court

[3] The word "section" was apparently omitted following the comma.

shall take into consideration (in addition to other factors) the size of the business, the economic impact of the penalty on the business, and the seriousness of the violation. Notice of the commencement of such action shall be given to the appropriate State air pollution control agency. In the case of any action brought by the Administrator under this subsection, the court may award costs of litigation (including reasonable attorney and expert witness fees) to the party or parties against whom such action was brought in any case where the court finds that such action was unreasonable.

(c)(1) Any person who knowingly—

(A) violates any requirement of an applicable implementation plan (i) during any period of Federally assumed enforcement, or (ii) more than 30 days after having been notified by the Administration under subsection (a)(1) that such person is violating such requirement, or

(B) violates or fails or refuses to comply with any order under section 119 or under subsection (a) or (d) of this section, or

(C) violates section 111(e), section 112(c), or

(D) violates any requirement of section 119(g) (as in effect before the date of the enactment of this Act, subsection (b)(7) or (d)(5) of section 120 (relating to noncompliance penalties), or any requirement of part B (relating to ozone), shall be punished by a fine of not more than $25,000 per day of violation, or by imprisonment for not more than one year, or by both. If the conviction is for a violation committed after the first conviction of such person under this paragraph, punishment shall be by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two years, or by both.

(2) Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this Act or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Act, shall upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six months, or by both.

(3) For the purpose of this subsection, the term "person" includes, in addition to the entities referred to in section 302(e), any responsible corporate officer.

(d)(1) A State (or, after thirty days notice to the State, the Administrator) may issue to any stationary source which is unable to comply with any requirement of an applicable implementation plan an order which specifies a date for final compliance with such requirement later than the date for attainment of any national ambient air quality standard specified in such plan if—

(A) such order is issued after notice to the public (and, as appropriate, to the Administrator) containing the content of the proposed order and opportunity for public hearing;

(B) the order contains a schedule and timetable for compliance;

(C) the order requires compliance with applicable interim requirements as provided in paragraph (5)(B) (relating to sources converting to coal), and paragraphs (6) and (7) (relating to all sources receiving such orders) and requires the emission monitoring and reporting by the source authorized to be required under sections 110(a)(2)(F) and 114(a)(1);

(D) the order provides for final compliance with the requirement of the applicable implementation plan as expeditiously as practicable, but (except as provided in paragraph (4) or (5)) in no event later than July 1, 1979, or three years after the date for final compliance with such requirement specified in such plan, whichever is later; and

(E) in the case of a major stationary source, the order notifies the source that, unless exempted under section 120(a)(2)(B) or (C), it will be required to pay a noncompliance penalty effective July 1, 1979, as provided under section 120 or by such later date as is set forth in the order in accordance with section 120(b)(3) or (g), in the event such source fails to achieve final compliance by July 1, 1976.

(2) In the case of any major stationary source, no such order issued by the State shall take effect until the Administrator determines that such order has been issued in accordance with the requirements of this Act. The Administrator shall determine, not later than 90 days after receipt of notice of the issuance of an order under this subsection with respect to any major stationary source, whether or not any State order under this subsection is in accordance with the requirements of this Act. In the case of any source other than a major stationary source, such order issued by the State shall cease to be effective upon a determination by the Administrator that it was not issued in accordance with the requirements of this Act. If the Administrator so objects, he shall simultaneously proceed to issue an enforcement order in accordance with subsection (a) or an order under this subsection. Nothing in this section shall be construed as limiting the authority of a State or political subdivision to adopt and enforce a more stringent emission limitation or more expeditious schedule or timetable for compliance than that contained in an order by the Administrator.

(3) If any source not in compliance with any requirement of an applicable implementation plan gives written notification to the State (or the Administrator) that such

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source intends to comply by means of replacement of the facility, a complete change in production process or a termination of operation, the State (or the Administrator) may issue an order under paragraph (1) of this subsection permitting the source to operate until July 1, 1979, without any interim schedule of compliance: *Provided*, That as a condition of the issuance of any such order, the owner or operator of such source shall post a bond or other surety in an amount equal to the cost of actual compliance by such facility and any economic value which may accrue to the owner or operator of such source by reason of the failure to comply. If a source for which the bond or other surety required by this paragraph has been posted fails to replace the facility, change the production process, or terminate the operations as specified in the order by the required date, the owner or operator shall immediately forefit on the bond or other surety and the State (or the Administrator) shall have no discretion to modify the order under this paragraph or to compromise the bond or other surety.

(4) An order under paragraph (1) of this subsection may be issued to an existing stationary source if—

(A) the source will expeditiously use new means of emission limitation which the Administrator determines is likely to be adequately demonstrated (within the meaning of section 111(a)(1)) upon expiration of the order,

(B) such new means of emission limitation is not likely to be used by such source unless an order is granted under this subsection,

(C) such new means of emission limitation is determined by the Administrator to have a substantial likelihood of—

(i) achieving greater continuous emission reduction than the means of emission limitation which, but for such order, would be required; or

(ii) achieving an equivalent continuous reduction at lower cost in terms of energy, economic, or nonair quality environmental impact; and

(D) compliance by the source with the requirement of the applicable implementation plan would be impracticable prior to, or during, the installation of such new means.

Such an order shall provide for final compliance with the requirement in the applicable implementation plan as expeditiously as practicable, but in no event later than five years after the date on which the source would otherwise be required to be in full compliance with the requirement.

(5)(A) In the case of a major stationary source which is burning petroleum products or natural gas, or both and which—

(i) is prohibited from doing so under an order pursuant to the provisions of section 2(a) of the Energy Supply and Environmental Coordination Act of 1974 or any amendment thereto, or any subsequent enactment which supersedes such provisions, or

(ii) within one year after enactment of the Clean Air Act Amendments of 1977 gives notice of intent to convert to coal as its primary energy source because of actual or anticipated curtailment of natural gas supplies under any curtailment plan or schedule approved by the Federal Power Commission (or, in the case of intrastate natural gas supplies, approved by the appropriate State regulatory commission),

and which thereby would no longer be in compliance with any requirement under an applicable implementation plan, an order may be issued by the Administrator under paragraph (1) of this subsection for such source which specifies a date for final compliance with such requirement as expeditiously as practicable, but not later than December 31, 1980. The Administrator may issue an additional order under paragraph (1) of this subsection for such source providing an additional period for such source to come into compliance with the requirement in the applicable implementation plan. which shall be as expeditiously as practicable, but in no event later than five years after the date required for compliance under the preceding sentence.

(B) In issuing an order pursuant to subparagraph (A), the Administrator shall prescribe (and may from time to time modify) emission limitations, requirements respecting pollution characteristics of coal, or other enforceable measures for control of emissions for each source to which such an order applies. Such limitations, requirements, and measures shall be those which the Administrator determines must be complied with by the source in order to assure (throughout the period before the date for final compliance established in the order) that the burning of coal by such source will not result in emissions which cause or contribute to concentrations of any air pollutant in excess of any national primary ambient air quality standard for such pollutant.

(C) The Administrator may, by regulation, establish priorities under which manufacturers of continuous emission reduction systems necessary to carry out this paragraph shall provide such systems to users thereof, if he finds, after consultation with the States, that priorities must be imposed in order to assure that such systems are first provided to sources subject to orders under this paragraph in air quality control regions in which national primary ambient air quality standards have not been achieved. No regulation under this subparagraph may impair the obligation of any contract entered into

before the date of enactment of the Clean Air Act Amendments of 1977.

(D) No order issued to a source under this paragraph with respect to an air pollutant shall be effective if the national primary ambient air quality standard with respect to such pollutant is being exceeded at any time in the air quality control region in which such source is located. The preceding sentence shall not apply to a source if, upon submission by any person of evidence satisfactory to the Administrator, the Administrator determines (after notice and public hearing)—

(i) that emissions of such air pollutant from such source will affect only infrequently the air quality concentrations of such pollutant in each portion of the region where such standard is being exceeded at any time;

(ii) that emissions of such air pollutant from such source will have only insignificant effect on the air quality concentration of such pollutant in each portion of the region where such standard is being exceeded at any time; and

(iii) with reasonable statistical assurance that emissions of such air pollutant from such source will not cause or contribute to air quality concentrations of such pollutant in excess of the national primary ambient air quality standard for such pollutant.

(6) An order issued to a source under this subsection shall set forth compliance schedules containing increments of progress which require compliance with the requirement postponed as expeditiously as practicable.

(7) A source to which an order is issued under paragraph (1), (3), (4), or (5) of this subsection shall use the best practicable system or systems of emission reduction (as determined by the Administrator taking into account the requirement with which the source must ultimately comply) for the period during which such order is in effect and shall comply with such interim requirements as the Administrator determines are reasonable and practicable. Such interim requirements shall include—

(A) such measures as the Administrator determines are necessary to avoid an imminent and substantial endangerment to health of persons, and

(B) a requirement that the source comply with the requirements of the applicable implementation plan during any such period insofar as such source is able to do so (as determined by the Administrator).

(8) Any order under paragraph (1) of this subection shall be terminated if the Administrator determines on the record, after notice and hearing, that the inability of the source to comply no longer exists. If the owner or operator of the source to which the order is issued demonstrates that prompt termination of such order would result in undue hardship, the termination shall become effective at the earliest practicable date on which such undue hardship would not result, but in no event later than the date required under this subsection.

(9) If the Administrator determines that a source to which an order is issued under this subsection is in violation of any requirement of this subsection, he shall—

(A) enforce such requirement under subsections (a), (b), or (c) of this section,

(B) (after notice and opportunity for public hearing) revoke such order and enforce compliance with the requirement with respect to which such order was granted,

(C) give notice of noncompliance and commence action under section 120, or

(D) take any appropriate combination of such actions.

(10) During the period of the order in effect under this subsection and where the owner or operator is in compliance with the terms of such order, no Federal enforcement action pursuant to this section and no action under section 304 of this Act shall be pursued against such owner or operator based upon noncompliance during the period the order is in effect with the requirement for the source covered by such order.

(11) For the purposes of sections 110, 304, and 307 of this Act, any order issued by the State and in effect pursuant to this subsection shall become part of the applicable implementation plan.

(12) Any enforcement order issued under subsection (a) of this section or any consent decree in an enforcement action which is in effect on the day of enactment of the Clean Air Act Amendments of 1977 shall remain in effect to the extent that such order or consent decree is (A) not inconsistent with the requirements of this subsection and section 119 or (B) the administrative orders on consent issued by the Administrator on November 5, 1975 and February 26, 1976 and requiring compliance with sulfur dioxide emission limitations or standards at least as stringent as those promulgated under section 111. Any such enforcement order issued under subsection (a) of this section or consent decree which provides for an extension beyond July 1, 1979, except such administrative orders on consent, is void unless modified under this subsection within one year after the enactment of the Clean Air Act Amendments of 1977 to comply with the requirements of this subsection.

INSPECTIONS, MONITORING, AND ENTRY

SEC. 114. (a) For the purpose (i) of developing or assisting in the development of any implementation plan

under section 110 or 111(d), any standard of performance under section 111, or any emission standard under section 112[4] (ii) of determining whether any person is in violation of any such standard or any requirement of such a plan, or (iii) carrying out any provision of this Act (except a provision of title II with respect to a manufacturer of new motor vehicles or new motor vehicle engines) —

(1) the Administrator may require any person who owns or operates any emission source or who is subject to any requirement of this Act (other than a manufacturer subject to the provisions of section 206(c) or 208) with respect to a provision of title II to (A) establish and maintain such records, (B) make such reports, (C) install, use, and maintain *such monitoring equipment or methods, (D) sample* such emissions (in accordance with such methods, at such locations, at such intervals, and in such manner as the Administrator shall prescribe), and (E) provide such other information, as he may reasonably require; and

(2) the Administrator or his authorized representative, upon presentation of his credentials—

(A) shall have a right of entry to, upon, or through any premises of such person or in which any records required to be maintained under paragraph (1) of this section are located, and

(B) may at reasonable times have access to and copy any records, inspect any monitoring equipment and method required under paragraph (1), and sample any emissions which such person is required to sample under paragraph (1).

(b) (1) Each State may develop and submit to the Administrator a procedure for carrying out this section in such State. If the Administrator finds the State procedure is adequate, he may delegate to such State any authority he has to carry out this section.

(2) Nothing in this subsection shall prohibit the Administrator from carrying out this section in a State.

(c) Any records, reports, or information obtained under subsection (a) shall be available to the public, except that upon a showing satisfactory to the Administrator by any person that records, reports, or information, or particular part thereof, (other than emission data) to which the Administrator has access under this section if made public, would divulge methods or processes entitled to protection as trade secrets of such person, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the purposes of section 1905 of title 18 of the United States Code, except that such record, report, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this Act or when relevant in any proceeding under this Act.

[4] A comma was apparently omitted following "section 112."

(d) (1) In the case of any emission standard or limitation or other requirement which is adopted by a State, as part of an applicable implementation plan or as part of an order under section 113(d), before carrying out an entry, inspection, or monitoring under paragraph (2) of subsection (a) with respect to such standard, limitation, or other requirement, the Administrator (or his representatives) shall provide the State air pollution control agency with reasonable prior notice of such action, indicating the purpose of such action. No State agency which receives notice under this paragraph of an action proposed to be taken may use the information contained in the notice to inform the person whose property is proposed to be affected of the proposed action. If the Administrator has reasonable basis for believing that a State agency is so using or will so use such information, notice to the agency under this paragraph is not required until such time as the Administrator determines the agency will no longer so use information contained in a notice under this paragraph. Nothing in this section shall be construed to require notification to any State agency of any action taken by the Administrator with respect to any standard, limitation, or other requirement which is not part of an applicable implementation plan or which was promulgated by the Administrator under section 110(c).

(2) Nothing in paragraph (1) shall be construed to provide that any failure of the Administrator to comply with the requirements of such paragraph shall be a defense in any enforcement action brought by the Administrator or shall make inadmissible as evidence in any such action any information or material obtained notwithstanding such failure to comply with such requirements.

INTERNATIONAL AIR POLLUTION

SEC. 115. (a) Whenever the Administrator, upon receipt of reports, surveys or studies from any duly constituted international agency has reason to believe that any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country or whenever the Secretary of State requests him to do so with respect to such pollution which the Secretary of State alleges is of such a nature, the Administrator shall give formal notification

thereof to the Governor of the State in which such emissions originate.

(b) The notice of the Administrator shall be deemed to be a finding under section 110(a)(2)(H)(ii) which requires a plan revision with respect to so much of the applicable implementation plan as is inadequate to prevent or eliminate the endangerment referred to in subsection (a). Any foreign country so affected by such emission of pollutant or pollutants shall be invited to appear at any public hearing associated with any revision of the appropriate portion of the applicable implementation plan.

(c) This section shall apply only to a foreign country which the Administrator determines has given the United States essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country by this section.

(d) Recommendations issued following any abatement conference conducted prior to the enactment of the Clean Air Act Amendments of 1977 shall remain in effect with respect to any pollutant for which no national ambient air quality standard has been established under section 109 of this Act unless the Administrator, after consultation with all agencies which were party to the conference, rescinds any such recommendation on grounds of obsolescence.

RETENTION OF STATE AUTHORITY

SEC. 116. Except as otherwise provided in sections 119 (c), (e), and (f) (as in effect before the date of the enactment of the Clean Air Act Amendments of 1977), 209, 211(c)(4), and 233 (preempting certain State regulation of moving sources) nothing in this Act shall preclude or deny the right of any State or political subdivision thereof to adopt or enforce (1) any standard or limitation respecting emissions of air pollutants or (2) any requirement respecting control or abatement of air pollution; except that if an emission standard or limitation is in effect under an applicable implementation plan or under section 111 or 112, such State or political subdivision may not adopt or enforce any emission standard or limitation which is less stringent than the standard or limitation under such plan or section.

PRESIDENT'S AIR QUALITY ADVISORY BOARD AND ADVISORY COMMITTEES

SEC. 117. (a) In order to obtain assistance in the development and implementation of the purposes of this Act including air quality criteria, recommended control techniques, standards, research and development, and to encourage the continued efforts on the part of industry

to improve air quality and to develop economically feasible methods for the control and abatement of air pollution, the Administrator shall from time to time establish advisory committees. Committee members shall include, but not be limited to, persons who are knowledgeable concerning air quality from the standpoint of health, welfare, economics, or technology.

(b) The members of any other advisory committees appointed pursuant to this Act who are not officers or employees of the United States while attending conferences or meetings or while otherwise serving at the request of the Administrator, shall be entitled to receive compensation at a rate to be fixed by the Administrator, but not exceeding $100 per diem, including traveltime, and while away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5 of the United States Code for persons in the Government service employed intermittently.

(c) Prior to—

(1) issuing criteria for an air pollutant under section 108(a)(2),

(2) publishing any list under section 111(b)(1)(A) or 112(b)(1)(A),

(3) publishing any standard under section 111(b)(1)(B) or section 112(b)(1)(B), or

(4) publishing any regulation under section 202(a),

the Administrator shall, to the maximum extent practicable within the time provided, consult with appropriate advisory committees, independent experts, and Federal departments and agencies.

CONTROL OF POLLUTION FROM FEDERAL FACILITIES

SEC. 118. (a) Each department, agency, and instrumentality of executive, legislative, and judicial branches of the Federal Government (1) having jurisdiction over any property or facility, or (2) engaged in any activity resulting, or which may result, in the discharge of air pollutants, and each officer, agent, or employee thereof, shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of air pollution in the same manner, and to the same extent as any nongovernmental entity. The preceding sentence shall apply (A) to any requirement whether substantive or procedural (including any recordkeeping or reporting requirement, any requirement respecting permits and any other requirement whatsoever), (B) to the exercise of any Federal, State, or local administrative authority, and (C) to any process and

sanction, whether enforced in Federal, State, or local courts or in any other manner. This subsection shall apply notwithstanding any immunity of such agencies, officers, agents, or employees under any law or rule of law. No officer, agent, or employee of the United States shall be personally liable for any civil penalty for which he is not otherwise liable.

(b) The President, may exempt any emission source of any department, agency, or instrumentality in the executive branch from compliance with such a requirement if he determines it to be in the paramount interest of the United States to do so, except that no exemption may be granted from section 111, and an exemption from section 112 may be granted only in accordance with section 112(c). No such exemption shall be granted due to lack of appropriation unless the President shall have specifically requested such appropriation as a part of the budgetary process and the Congress shall have failed to make available such requested appropriation. Any exemption shall be for a period not in excess of one year, but additional exemptions may be granted for periods of not to exceed one year upon the President's making a new determination. In addition to any such exemption of a particular emission source, the President may, if he determines it to be in the paramount interest of the United States to do so, issue regulations exempting from compliance with the requirements of this section any weaponry, equipment, aircraft, vehicles, or other classes or categories of property which are owned or operated by the Armed Forces of the United States (including the Coast Guard) or by the National Guard of any State and which are uniquely military in nature. The President shall reconsider the need for such regulations at three-year intervals. The President shall report each January to the Congress all exemptions from the requirements of this section granted during the preceding calendar year, together with his reason for granting each such exemption.

PRIMARY NONFERROUS SMELTER ORDERS

SEC. 119. (a)(1) Upon application by the owner or operator of a primary nonferrous smelter, a primary nonferrous smelter order under subsection (b) may be issued—

(A) by the Adminstrator, after thirty days' notice to the State, or

(B) by the State in which such source is located, but no such order issued by the State shall take effect until the Administrator determines that such order has been issued in accordance with the requirements of this Act.

Not later than ninety days after submission by the State to the Administrator of notice of the issuance of a primary nonferrous smelter order under this section, the Administrator shall determine whether or not such order has been issued by the State in accordance with the requirements of this Act. If the Administrator determines that such order has not been issued in accordance with such requirements, he shall conduct a hearing respecting the reasonably available control technology for primary nonferrous smelters.

(2)(A) An order issued under this section to a primary nonferrous smelter shall be referred to as a "primary nonferrous smelter order". No primary nonferrous smelter may receive both an enforcement order under section 113(d) and a primary nonferrous smelter order under this section.

(B) Before any hearing conducted under this section, in the case of an application made by the owner or operator of a primary nonferrous smelter for a second order under this section, the applicant shall furnish the Administrator (or the State as the case may be) with a statement of the grounds on which such application is based (including all supporting documents and information). The statement of the grounds for the proposed order shall be provided by the Administrator or the State in any case in which such State or Administrator is acting on its own initiative. Such statement (including such documents and information) shall be made available to the public for a thirty-day period before such hearing and shall be considered as part of such hearing. No primary nonferrous smelter order may be granted unless the applicant establishes that he meets the conditions required for the issuance of such order (or the Administrator or State establishes the meeting of such conditions when acting on their own initiative).

(C) Any decision with respect to the issuance of a primary nonferrous smelter order shall be accompanied by a concise statement of the findings and of the basis of such findings.

(3) For the purposes of section [5] 110, 304, and 307 of this Act, any order issued by the State and in effect pursuant to this subsection shall become part of the applicable implementation plan.

(b) A primary nonferrous smelter order under this section may be issued to a primary nonferrous smelter if—

(1) such smelter is in existence on the date of the enactment of this section;

(2) the requirement of the applicable implementation plan with respect to which the order is issued is an emission limitation or standard for sulfur

[5] The word "section" is apparently intended to mean "sections".

oxides which is necessary and intended to be itself sufficient to enable attainment and maintenance of national primary and secondary ambient air quality standards for sulfur oxides; and

(3) such smelter is unable to comply with such requirement by the applicable date for compliance because no means of emission limitation applicable to such smelter which will enable it to achieve compliance with such requirement has been adequately demonstrated to be reasonably available (as determined by the Administrator, taking into account the cost of compliance, nonair quality health and environmental impact, and energy consideration).

(c)(1) A second order issued to a smelter under this section shall set forth compliance schedules containing increments of progress which require compliance with the requirement postponed as expeditiously as practicable. The increments of progress shall be limited to requiring compliance with subsection (d) and, in the case of a second order, to procuring, installing, and operating the necessary means of emission limitation as expeditiously as practicable after the Administrator determines such means have been adequately demonstrated to be reasonably available within the meaning of subsection (b)(3).

(2) Not in excess of two primary nonferrous smelter orders may be issued under this section to any primary nonferrous smelter. The first such order issued to a smelter shall not result in the postponement of the requirement with respect to which such order is issued beyond January 1, 1983. The second such order shall not result in the postponement of such requirement beyond January 1, 1988.

(d)(1)(A) Each primary nonferrous smelter to which an order is issued under this section shall be required to use such interim measures for the period during which such order is in effect as may be necessary in the judgment of the Administrator to assure attainment and maintenance of the national primary and secondary ambient air quality standards during such period, taking into account the aggregate effect on air quality of such order together with all variances, extensions, waivers, enforcement orders, delayed compliance orders and primary nonferrous smelter orders previously issued under this Act.

(B) Such interim requirements shall include—

(i) a requirement that the source to which the order applies comply with such reporting requirements and conduct such monitoring as the Administrator determines may be necessary, and

(ii) such measures as the Administrator determines are necessary to avoid an imminent and substantial endangerment to health of persons.

(C) Such interim measures shall also, except as provided in paragraph (2), include continuous emission reduction technology. The Administrator shall condition the use of any such interim measures upon the agreement of the owner or operator of the smelter—

(i) to comply with such conditions as the Administrator determines are necessary to maximize the reliability and enforceability of such interim measures, as applied to the smelter, in attaining and maintaining the national ambient air quality standards to which the order relates, and

(ii) to commit reasonable resources to research and development of appropriate emission control technology.

(2) The requirement of paragraph (1) for the use of continuous emission reduction technology may be waived with respect to a particular smelter by the State or the Administrator, after notice and a hearing on the record, and upon a showing by the owner or operator of the smelter that such requirement would be so costly as to necessitate permanent or prolonged temporary cessation of operations of the smelter. Upon application for such waiver, the Administrator shall be notified and shall, within ninety days, hold a hearing on the record in accordance with section 554 of title 5 of the United States Code. At such hearing the Administrator shall require the smelter involved to present information relating to any alleged cessation of operations and the detailed reasons or justifications therefor. On the basis of such hearing the Administrator shall make findings of fact as to the effect of such requirement and on the alleged cessation of operations and shall make such recommendations as he deems appropriate. Such report, findings, and recommendations shall be available to the public, and shall be taken into account by the State or the Administrator in making the decision whether or not to grant such waiver.

(3) In order to obtain information for purposes of a waiver under paragraph (2), the Administrator may, on his own motion, conduct an investigation and use the authority of section 321.

(4) In the case of any smelter which on the date of enactment of this section uses continuous emission reduction technology and supplemental controls and which receives an initial primary nonferrous smelter order under this section, no additional continuous emission reduction technology shall be required as a condition of such order unless the Administrator determines, at any time, after notice and public hearing, that such additional continuous emission reduction technology is adequately demonstrated to be reasonably available for the primary nonferrous smelter industry.

(e) At any time during which an order under this section applies, the Administration may enter upon a public hearing respecting the availability of technology. Any order under this section shall be terminated if the Administrator determines on the record, after notice and public hearing, that the conditions upon which the order was based no longer exist. If the owner or operator of the smelter to which the order is issued demonstrates that prompt termination of such order would result in undue hardship, the termination shall become effective at the earliest practicable date on which such undue hardship would not result, but in no event later than the date required under subsection (c).

(f) If the Administrator determines that a smelter to which an order is issued under this section is in violation of any requirement of subsection (c) or (d), he shall—

(1) enforce such requirement under section 113,

(2) (after notice and opportunity for public hearing) revoke such order and enforce compliance with the requirement with respect to which such order was granted.

(3) give notice of noncompliance and commence action under section 120, or

(4) take any appropriate combination of such actions.

NONCOMPLIANCE PENALTY

SEC. 120. (a)(1)(A) Not later than 6 months after the date of enactment of this section, and after notice and opportunity for a public hearing, the Administrator shall promulgate regulations requiring the assessment and collection of a noncompliance penalty against persons referred to in paragraph (2)(A).

(B)(i) Each State may develop and submit to the Administrator a plan for carrying out this section in such State. If the Administrator finds that the State plan meets the requirements of this section, he may delegate to such State any authority he has to carry out this action.

(ii) Notwithstanding a delegation to a State under clause (i), the Administrator may carry out this section in such State under the circumstances described in subsection (b)(2)(B).

(2)(A) Except as provided in subparagraph (B) or (C) of this paragraph, the State or the Administrator shall assess and collect a noncompliance penalty against every person who owns or operates—

(i) a major stationary source (other than a primary nonferrous smelter which has received a primary nonferrous smelter order under section 119) which is not in compliance with any emission limitation, emission standard or compliance schedule under any applicable implementation plan (whether or not such source is subject to a Federal or State consent decree), or

(ii) a stationary source which is not in compliance with an emission limitation, emission standard, standard of performance, or other requirement established under section 111 or 112 of this Act, or

(iii) any source referred to in clause (i) or (ii) (for which an extension, order, or suspension referred to in subparagraph (B), or Federal or State consent decree is in effect), or a primary nonferrous smelter which has received a primary nonferrous smelter order under section 119 which is not in compliance with any interim emission control requirement or schedule of compliance under such extension, order, suspension, or consent decree.

For purposes of subsection (d)(2), in the case of a penalty assessed with respect to a source referred to in clause (iii) of this subparagraph, the costs referred to in such subsection (d)(2) shall be the economic value of noncompliance with the interim emission control requirement or the remaining steps in the schedule of compliance referred to in such clause.

(B) Notwithstanding the requirements of subparagraph (A) (i) and (ii), the owner or operator of any source shall be exempted from the duty to pay a noncompliance penalty under such requirements with respect to that source if, in accordance with the procedures in subsection (b)(5), the owner or operator demonstrates that the failure of such source to comply with any such requirement is due solely to—

(i) a conversion by such source from the burning of petroleum products or natural gas, or both, as the permanent primary energy source to the burning of coal pursuant to an order under section 113(d)(5) or section 119 (as in effect before the date of the enactment of the Clean Air Act Amendments of 1977);

(ii) in the case of a coal-burning source granted an extension under the second sentence of section 119(c)(1) (as in effect before the date of the enactment of the Clean Air Act Amendments of 1977), a prohibition from using petroleum products or natural gas or both, by reason of an order under the provisions of section 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 or under any legislation which amends or supersedes such provisions;

(iii) the use of innovative technology sanctioned by an enforcement order under section 113(d)(4);

(iv) an inability to comply with any such requirement, for which inability the source has received an order under section 113(d) (or an order under section 113 issued before the date of enactment of this section) which has the effect of permitting a delay or violation of any requirement of this Act (including a requirement of an applicable implementation plan) which inability results from reasons entirely beyond the control of the owner or operator of such source or of any entity controlling, controlled by, or under common control with the owner or operator of such source; or

(v) the conditions by reason of which a temporary emergency suspension is authorized under section 110 (f) or (g).

An exemption under this subparagraph shall cease to be effective if the source fails to comply with the interim emission control requirements or schedules of compliance (including increments of progress) under any such extension, order, or suspension.

(C) The Administrator may, after notice and opportunity for public hearing, exempt any source from the requirements of this section with respect to a particular instance of noncompliance if he finds that such instance of noncompliance is de minimis in nature and in duration.

(b) Regulations under subsection (a) shall—

(1) permit the assessment and collection of such penalty by the State if the State has a delegation of authority in effect under subsection (a)(1)(B)(i);

(2) provide for the assessment and collection of such penalty by the Administrator, if—

(A) the State does not have a delegation of authority in effect under subsection (a)(1)(B)(i), or

(B) the State has such a delegation in effect but fails with respect to any particular person or source to assess or collect the penalty in accordance with the requirements of this section;

(3) require the States, or in the event the States fail to do so, the Administrator, to give a brief but reasonably specific notice of noncompliance under this section to each person referred to in subsection (a)(2)(A) with respect to each source owned or operated by such person which is not in compliance as provided in such subsection, not later than July 1, 1979, or thirty days after the discovery of such noncompliance, whichever is later;

(4) require each person to whom notice is given under paragraph (3) to—

(A) calculate the amount of the penalty owed (determined in accordance with subsection (d)(2) and the schedule of payments (determined in accordance with subsection (d)(3)) for each

such source and, within forty-five days after the issuance of such notice or after the denial of a petition under subparagraph (B), to submit that calculation and proposed schedule, together with the information necessary for an independent verification thereof, to the State and to the Administrator, or

(B) submit a petition, within forty-five days after the issuance of such notice, challenging such notice of noncompliance or alleging entitlement to an exemption under subsection (a)(2)(B) with respect to a particular source;

(5) require the Administrator to provide a hearing on the record (within the meaning of subchapter II of chapter 5 of title 5, United States Code) and to make a decision on such petition (including findings of fact and conclusions of law) not later than ninety days after the receipt of any petition under paragraph (4)(B), unless the State agrees to provide a hearing which is sustantially similar to such a hearing on the record and to make a decision on such petition (including such findings and conclusions) within such ninety day period;

(6)(A) authorize the Administrator on his own initiative to review the decision of the State under paragraph (5) and disapprove it if it is not in accordance with the requirements of this section, and (B) require the Administrator to do so not later than sixty days after receipt of a petition under this subparagraph, notice, and public hearing and a showing by such petitioner that the State decision under paragraph (5) is not in accordance with the requirements of this section;

(7) require payment, in accordance with subsection (d), of the penalty by each person to whom notice of noncompliance is given under paragraph (3) with respect to each noncomplying source for which such notice is given unless there has been a final determination granting a petition under paragraph (4)(B) with respect to such source;

(8) authorize the State or the Administrator to adjust (and from time to time to readjust) the amount of the penalty assessment calculated or the payment schedule proposed by such owner or operator under paragraph (4), if the Administrator finds after notice and opportunity for a hearing on the record that the penalty or schedule does not meet the requirements of this section; and

(9) require a final adjustment of the penalty within 180 days after such source comes into compliance in accordance with subsection (d)(4).

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In any case in which the State establishes a noncompliance penalty under this section, the State shall provide notice thereof to the Administrator. A noncompliance penalty established by a State under this section shall apply unless the Administrator, within ninety days after the date of receipt of notice of the State penalty assessment under this section, objects in writing to the amount of the penalty as less than would be required to comply with guidelines established by the Administrator. If the Administrator objects, he shall immediately establish a substitute noncompliance penalty applicable to such source.

(c) If the owner or operator of any stationary source to whom a notice is issued under subsection (b)(3)—

(1) does not submit a timely petition under subsection (b)(4)(B), or

(2) submits a petition under subsection (b)(4)(B) which is denied, and

fails to submit a calculation of the penalty assessment, a schedule for payment, and the information necessary for independent verification thereof, the State (or the Administrator, as the case may be) may enter into a contract with any person who has no financial interest in the owner or operator of the source (or in any person controlling, controlled by or under common control with such source) to assist in determining the amount of the penalty assessment or payment schedule with respect to such source. The cost of carrying out such contract may be added to the penalty to be assessed against the owner or operator of such source.

(d)(1) All penalties assessed by the Administrator under this section shall be paid to the United States Treasury. All penalties assessed by the State under this section shall be paid to such State.

(2) The amount of the penalty which shall be assessed and collected with respect to any source under this section shall be equal to—

(A) the amount determined in accordance with regulations promulgated by the Administrator under subsection (a), which is no less than the economic value which a delay in compliance beyond July 1, 1979, may have for the owner of such source, including the quarterly equivalent of the capital costs of compliance and debt service over a normal amortization period, not to exceed ten years, operation and maintenance costs foregone as a result of noncompliance, and any additional economic value which such a delay may have for the owner or operator of such source, minus

(B) the amount of any expenditure made by the owner or operator of that source during any such quarter for the purpose of bringing that source into,

and maintaining compliance with, such requirement, to the extent that such expenditures have not been taken into account in the calculation of the penalty under subparagraph (A).

To the extent that any expenditure under subparagraph (B) made during any quarter is not subtracted for such quarter from the costs under subparagraph (A), such expenditure may be subtracted for any subsequent quarter from such costs. In no event shall the amount paid be less than the quarterly payment minus the amount attributed to actual cost of construction.

(3)(A) The assessed penalty required under this section shall be paid in quarterly installments for the period of covered noncompliance. All quarterly payments (determined without regard to any adjustment or any subtraction under paragraph (2)(B)) after the first payment shall be equal.

(B) The first payment shall be due on the date six months after the date of issuance of the notice of noncompliance under subsection (b)(3) with respect to any source or on January 1, 1980, whichever is later. Such first payment shall be in the amount of the quarterly installment for the upcoming quarter, plus the amount owed for any preceding period within the period of covered noncompliance for such source.

(C) For the purpose of this section, the term "period of covered noncompliance" means the period which begins—

(i) two years after the date of enactment of this section, in the case of a source for which notice of noncompliance under subsection (b)(3) is issued on or before the date two years after such date of enactment, or

(ii) on the date of issuance of the notice of noncompliance under subsection (b)(3), in the case of a source for which such notice is issued after July 1, 1979,

and ending on the date on which such source comes into (or for the purpose of establishing the schedule of payments, is estimated to come into) compliance with such requirement.

(4) Upon making a determination that a source with respect to which a penalty has been paid under this section is in compliance and is maintaining compliance with the applicable requirement, the State (or the Administrator as the case may be) shall review the actual expenditures made by the owner or operator of such source for the purpose of attaining and maintaining compliance, and shall within 180 days after such source comes into compliance—

(A) provide reimbursement with interest (to be paid by the State or Secretary of the Treasury, as the

case may be) at appropriate prevailing rates (as determined by the Secretary of the Treasury) for any overpayment by such person, or

(B) assess and collect an additional payment with interest at appropriate prevailing rates (as determined by the Secretary of the Treasury) for any underpayment by such person.

(5) Any person who fails to pay the amount of any penalty with respect to any source under this section on a timely basis shall be required to pay in addition a quarterly nonpayment penalty for each quarter during which such failure to pay persists. Such nonpayment penalty shall be in an amount equal to 20 percent of the aggregate amount of such person's penalties and nonpayment penalties with respect to such source which are unpaid as of the beginning of such quarter.

(e) Any action pursuant to this section, including any objection of the Administrator under the last sentence of subsection (b), shall be considered a final action for purposes of judicial review of any penalty under section 307 of this Act.

(f) Any orders, payments, sanctions, or other requirements under this section shall be in addition to any other permits, orders, payments, sanctions, or other requirements established under this Act, and shall in no way affect any civil or criminal enforcement proceedings brought under any provisions of this Act or State or local] w.

(g) In the case of any emission limitation or other requirement approved or promulgated by the Administrator under this Act after the enactment of the Clean Air Act Amendments of 1977 which is more stringent than the emission limitation or requirement for the source in effect prior to such approval or promulgation, if any, or where there was no emission limitation or requirement approved or promulgated before enactment of the Clean Air Act Amendments of 1977, the date for imposition of the non-compliance penalty under this section, shall be either July 1, 1979, or the date on which the source is required to be in full compliance with such emission limitation or requirement, whichever is later, but in no event later than three years after the approval or promulgation of such emission limitation or requirement.

CONSULTATION

SEC. 121. In carrying out the requirements of this Act requiring applicable implementation plans to contain—

(1) any transportation controls, air quality maintenance plan requirements or preconstruction review of direct sources of air pollution, or

(2) any measure referred to—

(A) in part D (pertaining to nonattainment requirements), or

(B) in part C (pertaining to prevention of significant deterioration),

and in carrying out the requirements of section 113(d) (relating to certain enforcement orders), the State shall provide a satisfactory process of consultation with general purpose local governments, designated organizations of elected officials of local governments and any Federal land manager having authority over Federal land to which the State plan applies, effective with respect to any such requirement which is adopted more than one year after the date of enactment of the Clean Air Act Amendments of 1977 as part of such plan. Such process shall be in accordance with regulations promulgated by the Administrator to assure adequate consultation. Such regulations shall be promulgated after notice and opportunity for public hearing and not later than 6 months after the date of enactment of the Clean Air Act Amendments of 1977. Only a general purpose unit of local government, regional agency, or council of governments adversely affected by action of the Administrator approving any portion of a plan referred to in this subsection may petition for judicial review of such action on the basis of a violation of the requirements of this section.

LISTING OF CERTAIN UNREGULATED POLLUTANTS

SEC. 122. (a) Not later than one year after date of enactment of this section (two years for radioactive pollutants) and after notice and opportunity for public hearing, the Administrator shall review all available relevant information and determine whether or not emissions of radioactive pollutants (including source material, special nuclear material, and byproduct material), cadmium, arsenic and polycyclic organic matter into the ambient air will cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health. If the Administrator makes an affirmative determination with respect to any such substance, he shall simultaneously with such determination include such substance in the list published under section 108(a)(1) or 112(b)(1)(A) (in the case of a substance which, in the judgment of the Administrator, causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness), or shall include each category of stationary sources emitting such substance in significant amounts in the list published under section 111(b)(1)(A), or take any combination of such actions.

(b) Nothing in subsection (a) shall be construed to affect the authority of the Administrator to revise any list referred to in subsection (a) with respect to any substance (whether or not enumerated in subsection (a)).

(c)(1) Before listing any source material, special nuclear, or byproduct material (or component or derivative thereof) as provided in subsection (a), the Administrator shall consult with the Nuclear Regulatory Commission.

(2) Not later than six months after listing any such material (or component or derivative thereof) the Administrator and the Nuclear Regulatory Commission shall enter into an interagency agreement with respect to those sources or facilities which are under the jurisdiction of the Commission. This agreement shall, to the maximum extent practicable consistent with this Act, minimize duplication of effort and conserve administrative resources in the establishment, implementation, and enforcement of emission limitations, standards of performance, and other requirements and authorities (substantive and procedural) under this Act respecting the emission of such material (or component or derivative thereof) from such sources or facilities.

(3) In case of any standard or emission limitation promulgated by the Administrator, under this Act or by any State (or the Administrator) under any applicable implementation plan under this Act, if the Nuclear Regulatory Commission determines, after notice and opportunity for public hearing that the application of such standard or limitation to a source or facility within the jurisdiction of the Commission would endanger public health or safety, such standard or limitation shall not apply to such facilities or sources unless the President determines otherwise within ninety days from the date of such finding.

STACK HEIGHTS

SEC. 123. (a) The degree of emission limitation required for control of any air pollutant under an applicable implementation plan under this title shall not be affected in any manner by—

(1) so much of the stack height of any source as exceeds good engineering practice (as determined under regulations promulgated by the Administrator), or

(2) any other dispersion technique.

The preceding sentence shall not apply with respect to stack heights in existence before the date of enactment of the Clean Air Amendments of 1970 or dispersion techniques implemented before such date. In establishing an emission limitation for coal-fired steam electric generating units which are subject to the provisions of section 118 and which commenced operation before July 1, 1957, the effect of the entire stack height of stacks for which a

construction contract was awarded before February 8, 1974, may be taken into account.

(b) For the purpose of this section, the term "dispersion technique" includes any intermittent or supplemental control of air pollutants varying with atmospheric conditions.

(c) Not later than six months after the date of enactment of this section, the Administrator, shall after notice and opportunity for public hearing, promulgate regulations to carry out this section. For purposes of this section, good engineering practice means, with respect to stack heights, the height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies and wakes which may be created by the source itself, nearby structures or nearby terrain obstacles (as determined by the Administrator). For purposes of this section such height shall not exceed two and a half times the height of such source unless the owner or operator of the source demonstrates, after notice and opportunity for public hearing, to the satisfaction of the Administrator, that a greater height is necessary as provided under the preceding sentence. In no event may the Administrator prohibit any increase in any stack height or restrict in any manner the stack height of any source.

ASSURANCE OF ADEQUACY OF STATE PLANS

SEC. 124. (a) As expeditiously as practicable but not later than one year after date of enactment of this section, each State shall review the provisions of its implementation plan which relate to major fuel burning sources and shall determine—

(1) the extent to which compliance with requirements of such plan is dependent upon the use by major fuel burning stationary sources of petroleum products or natural gas,

(2) the extent to which such plan may reasonably be anticipated to be inadequate to meet the requirements of this Act in such State on a reliable and long-term basis by reason of its dependence upon the use of such fuels, and

(3) the extent to which compliance with the requirements of such plan is dependent upon use of coal or coal derivatives which is not locally or regionally available.

Each State shall submit the results of its review and its determination under this paragraph to the Administrator promptly upon completion thereof.

(b)(1) Not later than eighteen months after the date of enactment of this section, the Administrator shall re-

view the submissions of the States under subsection (a) and shall require each State to revise its plan if, in the judgment of the Administrator, such plan revision is necessary to assure that such plan will be adequate to assure compliance with the requirements of this Act in such State on a reliable and long-term basis, taking into account the actual or potential prohibitions on use of petroleum products or natural gas, or both, under any other authority of law.

(2) Before requiring a plan revision under this subsection, with respect to any State the Administrator shall take into account the report of the review conducted by such State under paragraph (1) and shall consult with the Governor of the State respecting such required revision.

MEASURES TO PREVENT ECONOMIC DISRUPTION OR UNEMPLOYMENT

SEC. 125. (a) After notice and opportunity for a public hearing—

(1) the Governor of any State in which a major fuel burning stationary source referred to in this subsection (or class or category thereof) is located,

(2) the Administrator, or

(3) the President (or his designee),

may determine that action under subsection (b) is necessary to prevent or minimize significant local or regional economic disruption or unemployment which would otherwise result from use by such source (or class or category) of—

(A) coal or coal derivatives other than locally or regionally available coal,

(B) petroleum products,

(C) natural gas, or

(D) any combination of fuels referred to in subparagraphs (A) through (C),

to comply with the requirements of a State implementation plan.

(b) Upon a determination under subsection (a)—

(1) such Governor, with the written consent of the President or his designee,

(2) the President's designee with the written consent of such Governor, or

(3) the President

may by rule or order prohibit any such major fuel burning stationary source (or class or category thereof) from using fuels other than locally or regionally available coal or coal derivatives to comply with implementation plan requirements. In taking any action under this subsection, the Governor, the President, or the President's designee as the case may be, shall take into account, the final cost to the consumer of such an action.

(c) The Governor, in the case of action under subsection (b)(1), or the Administrator, in the case of an action under subsection (b) (2) or (3) shall, by rule or order, require each source to which such action applies to—

(1) enter into long-term contracts of at least ten years in duration (except as the President or his designee may otherwise permit or require by rule or order for good cause) for supplies of regionally available coal or coal derivatives,

(2) enter into contracts to acquire any additional means of emission limitation which the Administrator or the State determines may be necessary to comply with the requirements of this Act while using such coal or coal derivatives as fuel, and

(3) comply with such schedules (including increments of progress), timetables and other requirements as may be necessary to assure compliance with the requirements of this Act.

Requirements under this subsection shall be established simultaneously with, and as a condition of, any action under subsection (b).

(d) This section applies only to existing or new major fuel burning stationary sources—

(1) which have the design capacity to produce 250,000,000 Btu's per hour (or its equivalent), as determined by the Administrator, and

(2) which are not in compliance with the requirements of an applicable implementation plan or which are prohibited from burning oil or natural gas, or both, under any other authority of law.

(e) Except as may otherwise be provided by rule by the State or the Administrator for good cause, any action required to be taken by a major fuel burning stationary source under this section shall not be deemed to constitute a modification for purposes of section 111(a) (2) and (4) of this Act.

(f) For purposes of sections 113 and 120 a prohibition under subsection (b), and a corresponding rule or order under subsection (c), shall be treated as a requirement of section 113. For purposes of any plan (or portion thereof) promulgated under section 110(c), any rule or order under subsection (c) corresponding to a prohibition under subsection (b), shall be treated as a part of such plan. For purposes of section 113, a prohibition under subsection (b), applicable to any source, and a corresponding rule or order under subsection (c), shall be treated as part of the applicable implementation plan for the State in which subject source is located.

(g) The President may delegate his authority under this section to an officer or employee of the United States designated by him on a case-by-case basis or in any other manner he deems suitable.

(h) For the purpose of this section the term "locally or regionally available coal or coal derivatives" means coal or coal derivatives which is, or can in the judgment of the State or the Administrator feasibly be, mined or produced in the local or regional area (as determined by the Administrator) in which the major fuel burning stationary source is located.

INTERSTATE POLLUTION ABATEMENT

SEC. 126. (a) Each applicable implementation plan shall—

(1) require each major proposed new (or modified) source—

(A) subject to part C (relating to significant deterioration of air quality) or

(B) which may significantly contribute to levels of air pollution in excess of the national ambient air quality standards in any air quality control region outside the State in which such source intends to locate (or make such modification),

to provide written notice to all nearby States the air pollution levels of which may be affected by such source at least sixty days prior to the date on which commencement of construction is to be permitted by the State providing notice, and

(2) identify all major existing stationary sources which may have the impact described in paragraph (1) with respect to new or modified sources and provide notice to all nearby States of the identity of such sources not later than three months after the date of enactment of the Clean Air Act Amendments of 1977.

(b) Any State or political subdivision may petition the Administrator for a finding that any major source emits or would emit any air pollutant in violation of the prohibition of section 110(a)(2)(E)(i). Within 60 days after receipt of any petition under this subsection and after public hearing, the Administrator shall make such a finding or deny the petition.

(c) Notwithstanding any permit which may have been granted by the State in which the source is located (or intends to locate), it shall be a violation of the applicable implementation plan in such State—

(1) for any major proposed new (or modified) source with respect to which a finding has been made under subsection (b) to be constructed or to operate in violation of the prohibition of section 110(a)(2)(E)(i), or

(2) for any major existing source to operate more than three months after such finding has been made with respect to it.

The Administrator may permit the continued operation of a source referred to in paragraph (2) beyond the expiration of such three-month period if such source complies with such emission limitations and compliance schedules (containing increments of progress) as may be provided by the Administrator to bring about compliance with the requirements contained in section 110(a)(2)(E)(i) as expeditiously as practicable, but in no case later than three years after the date of such finding. Nothing in the preceding sentence shall be construed to preclude any such source from being eligible for an enforcement order under section 113(d) after the expiration of such period during which the Administrator has permitted continuous operation.

SEC. 127. (a) Each State plan shall contain measures which will be effective to notify the public during any calendar year on a regular basis of instances or areas in which any national primary ambient air quality standard is exceeded or was exceeded during any portion of the preceding calendar year to advise the public of the health hazards associated with such pollution, and to enhance public awareness of the measures which can be taken to prevent such standards from being exceeded and the ways in which the public can participate in regulatory and other efforts to improve air quality. Such measures may include the posting of warning signs on interstate highway access points to metropolitan areas or television, radio, or press notices or information.

(b) The Administrator is authorized to make grants to States to assist in carrying out the requirements of subsection (a).

STATE BOARDS

SEC. 128. (a) Not later than the date one year after the date of the enactment of this section, each applicable implementation plan shall contain requirements that—

(1) any board or body which approves permits or enforcement orders under this Act shall have at least a majority of members who represent the public interest and do not derive any significant portion of their income from persons subject to permits or enforcement orders under this Act, and

(2) any potential conflicts of interest by members of such board or body or the head of an executive agency with similar powers be adequately disclosed.

A State may adopt any requirements respecting conflicts of interest for such boards or bodies or heads of executive agencies, or any other entities which are more stringent than the requirements of paragraph (1) and (2), and the Administrator shall approve any such more stringent requirements submitted as part of an implementation plan.

PART B—OZONE PROTECTION

PURPOSES

SEC. 150. The purposes of this part are (1) to provide for a better understanding of the effects of human actions on the stratosphere, especially the ozone in the stratosphere, (2) to provide for a better understanding of the effects of changes in the stratosphere, especially the ozone in the stratosphere on the public health and welfare, (3) to provide information on the progress of regulation of activities which may reasonably be anticipated to affect the ozone in the stratosphere in such a way as to cause or contribute to endangerment of the public health or welfare, and (4) to provide information on the need for additional legislation in this area, if any.

FINDINGS AND DEFINITIONS

SEC. 151. (a) The Congress finds, on the basis of presently available information, that—

(1) halocarbon compounds introduced into the environment potentially threaten to reduce the concentration of ozone in the stratosphere;

(2) ozone reduction will lead to increased incidence of solar ultraviolet radiation at the surface of the Earth;

(3) increased incidence of solar ultraviolet radiation is likely to cause increased rates of disease in humans (including increased rates of skin cancer), threaten food crops, and otherwise damage the natural environment;

(4) other substances, practices, processes, and activities may affect the ozone in the stratosphere, and should be investigated to give early warning of any potential problem and to develop the basis for possible future regulatory action; and

(5) there is some authority under existing law, to regulate certain substances, practices, processes, and activities which may affect the ozone in the stratosphere.

DEFINITIONS

SEC. 152. For the purposes of this subtitle—

(1) the term "halocarbon" means the chemical compounds $CFCl_3$ and CF_2Cl_2 and such other halogenated compounds as the Administrator determines may reasonably be anticipated to contribute to reductions in the concentration of ozone in the stratosphere;

(2) the term "stratosphere" means that part of the atmosphere above the tropopause.

STUDIES BY ENVIRONMENTAL PROTECTION AGENCY

SEC. 153. (a) The Administrator shall conduct a study of the cumulative effect of all substances, practices, processes, and activities which may affect the stratosphere, especially ozone in the stratosphere. The study shall include an analysis of the independent effects on the stratosphere especially such ozone in the stratosphere of—

(1) the release into the ambient air of halocarbons,

(2) the release into the ambient air of other sources of chlorine,

(3) the uses of bromine compounds, and

(4) emissions of aircraft and aircraft propulsion systems employed by operational and experimental aircraft.

The study shall also include such physical, chemical, atmospheric, biomedical, or other research and monitoring as may be necessary to ascertain (A) any direct or indirect effects upon the public health and welfare of changes in the stratosphere, especially ozone in the stratosphere, and (B) the probable causes of changes in the stratosphere, especially the ozone in the stratosphere.

(b) The Administrator shall undertake research on—

(1) methods to recover and recycle substances which directly or indirectly affect the stratosphere, especially ozone in the stratosphere,

(2) methods of preventing the escape of such substances,

(3) safe substitutes for such substances, and

(4) other methods to regulate substances, practices, processes, and activities which may reasonably be anticipated to affect the stratosphere, especially ozone in the stratosphere.

(c)(1) The studies and research conducted under this section may be undertaken with such cooperation and assistance from universities and private industry as may be available. Each department, agency, and instrumentality of the United States having the capability to do so is authorized and encouraged to provide assistance to the Administrator in carrying out the requirements of this section, including (notwithstanding any other provision of law) any services which such department, agency, or instrumentality may have the capability to render or obtain by contract with third parties.

(2) The Administrator shall encourage the cooperation and assistance of other nations in carrying out the studies and research under this section. The Administrator is authorized to cooperate with and support similar research efforts of other nations.

(d)(1) The Administrator shall undertake to contract with the National Academy of Sciences to study the state of knowledge and the adequacy of research efforts to

understand (A) the effects of all substances, practices, processes, and activities which may affect the stratosphere, especially ozone in the stratosphere; (B) the health and welfare effects of modifications of the stratosphere, especially ozone in the stratosphere; and (C) methods of control of such substances, practices, processes, and activities including alternatives, costs, feasibility, and timing. The Academy shall make a report of its findings by January 1, 1978.

(2) The Administrator shall make available to the Academy such information in the Administrator's possession as is needed for the purposes of the study provided for in this subsection.

(e) The Secretary of Labor shall study and transmit a report to the Administrator and the Congress not later than six months after date of enactment, with respect to the losses and gains to industry and employment which could result from the elimination of the use of halocarbons in aerosol containers and for other purposes. Such report shall include recommended means of alleviating unemployment or other undesirable economic impact, if any, resulting therefrom.

(f)(1) The Administrator shall establish and act as Chairman of a Coordinating Committee for the purpose of insuring coordination of the efforts of other Federal agencies carrying out research and studies related to or supportive of the research provided for in subsections (a) and (b) and section 154.

(2) Members of the Coordinating Committee shall include the appropriate official responsible for the relevant research efforts of each of the following agencies:

(A) the National Oceanic and Atmospheric Administration,

(B) the National Aeronautics and Space Administration,

(C) the Federal Aviation Administration,

(D) the Department of Agriculture.

(E) the National Cancer Institute,

(F) the National Institute of Environmental Health Sciences,

(G) the National Science Foundation, and the appropriate officials responsible for the relevant research efforts of such other agencies carrying out related efforts as the Chairman shall designate. A representative of the Department of State shall sit on the Coordinating Committee to encourage and facilitate international coordination.

(3) The Coordinating Committee shall review and comment on plans for, and the execution and results of, pertinent research and studies. For this purpose, the agencies named in or designated under paragraph (2) of this subsection shall make appropriate and timely reports to the Coordinating Committee on plans for and the execution and results of such research and studies.

(4) The Chairman may request a report from any Federal Agency for the purpose of determining if that agency should sit on the Coordinating Committee.

(g) Not later than January 1, 1978, and biennially thereafter, the Administrator shall report to the appropriate committees of the House and the Senate, the results of the studies and research conducted under this section and the results of related research and studies conducted by other Federal agencies.

RESEARCH AND MONITORING BY OTHER AGENCIES

SEC. 154. (a) The Administrator of the National Oceanic and Atmospheric Administration shall establish a continuing program of research and monitoring of the stratosphere for the purpose of early detection of changes in the stratosphere and climatic effects of such changes. Such Administrator shall on or before January 1, 1978, and biennially thereafter, transmit such report to the Administrator and the Congress on the findings of such research and monitoring. Such report shall contain any appropriate recommendations for legislation or regulation (or both).

(b) The National Aeronautics and Space Administration shall, pursuant to its authority under title IV of the National Aeronautics and Space Act of 1958, *continue* programs of research, technology, and monitoring of the stratosphere for the purpose of understanding the physics and chemistry of the stratosphere and for the early detection of potentially harmful changes in the ozone in the stratosphere. Such Administration shall transmit reports by January 1, 1978, and biennially thereafter to the Administrator and the Congress on the results of the programs authorized in this subsection, together with any appropriate recommendations for legislation or regulation (or both).

(c) The Director of the National Science Foundation shall encourage and support ongoing stratospheric research programs and continuing research programs that will increase scientific knowledge of the effects of changes in the ozone layer in the stratosphere upon living organisms and ecosystems. Such Director shall transmit reports by January 1, 1978, and biennially thereafter to the Administrator and the Congress on the results of such programs, together with any appropriate recommendations for legislation or regulation (or both).

(d) The Secretary of Agriculture shall encourage and support continuing research programs that will increase scientific knowledge of the effects of changes in the ozone in the stratosphere upon animals, crops, and other plant life. Such Secretary shall transmit reports by January 1, 1978, and biennially thereafter to the Administrator and the Congress on the results of such programs together

with any appropriate recommendations for legislation or regulation (or both).

(e) The Secretary of Health, Education, and Welfare shall encourage and support continuing research programs that will increase scientific knowledge of the effects of changes in the ozone in the stratosphere upon human health. Such Secretary shall transmit reports by January 1, 1978, and biennially thereafter, to the Administrator and the Congress on the results of such programs, together with any appropriate recommendations for legislation or regulation (or both).

(f) In carrying out subsections (a) through (e) of this section, the agencies involved (1) shall enlist and encourage cooperation and assistance from other Federal agencies, universities, and private industry, and (2) shall solicit the views of the Administrator with regard to plans for the research involved so that any such research will, if regulatory action by the Administrator is indicated, provide the preliminary information base for such action.

PROGRESS OF REGULATION

SEC. 155. The Administrator shall provide an interim report to the Congress by January 1, 1978, shall provide a final report within two years after date of enactment, and shall provide follow-up reports anually thereafter on the actions taken by the Environmental Protection Agency and all other Federal agencies to regulate sources of halocarbon emissions, the results of such regulations in protecting the ozone layers, and the need for additional regulatory action, if any. The reports under this section shall also include recommendations for the control of substances, practices, processes, and activities other than those involving halocarbons, which are found to affect the ozone in the stratosphere and which may cause or contribute to harmful effects on public health or welfare.

INTERNATIONAL COOPERATION

SEC. 156. The President shall undertake to enter into international agreements to foster cooperative research which complements studies and research authorized by this part, and to develop standards and regulations which protect the stratosphere consistent with regulations applicable within the United States. For these purposes the President through the Secretary of State and the Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, shall negotiate multilateral treaties, conventions, resolutions, or other agreements, and formulate, present, or support proposals at the United Nations and other appropriate international forums and shall report to the Congress periodically on efforts to arrive at such agreements.

REGULATIONS

SEC. 157. (a) If at any time prior to the submission of the final report referred to in section 155 in the Administrator's judgment, any substance, practice, process, or activity may reasonably be anticipated to affect the stratosphere, especially ozone in the stratosphere, and such effect may reasonably be anticipated to endanger public health or welfare, the Administrator shall promptly promulgate regulations respecting the control of such substance, practice, process, or activity, and shall simultaneously submit notice of the promulgation of such regulation to the Congress.

(b) Upon submission of the final report referred to in section 155, and after consideration of the research and study under sections 153 and 154 and, consultation with appropriate Federal agencies and scientific entities, the Administrator shall propose regulations for the control of any substance, practice, process, or activity (or any combination thereof) which in his judgment may reasonably be anticipated to affect the stratosphere, especially ozone in the stratosphere, if such effect in the stratosphere may reasonably be anticipated to endanger public health or welfare. Such regulations shall take into account the feasibility and the costs of achieving such control. Such regulations may exempt medical use products for which the Administrator determines there is no suitable substitute. Not later than three months after proposal of such regulations the Administrator shall promulgate such regulations in final form. From time to time, and under the same procedures, the Administrator may revise any of the regulations submitted under this subsection.

OTHER PROVISIONS UNAFFECTED

SEC. 158. Nothing in this part shall be construed to alter or affect the authority of the Administrator under section 303 (relating to emergency powers), under section 231 (relating to aircraft emission standards), or under any other provision of this Act or to affect the authority of any other department, agency, or instrumentality of the United States under any other provision of law to promulgate or enforce any requirement respecting the control of any substance, practice, process, or activity for purposes of protecting the stratosphere or ozone in the stratosphere. In the case of any proposed rule respecting ozone in the stratosphere which has been published under the Toxic Substances Control Act prior to the date of enactment of this Act notwithstanding section 9(b) of such Act, nothing in this part shall be construed to prohibit or restrict the Administrator from taking any action under the Toxic Substances Control Act respecting the promulgation or enforcement of such rule.

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STATE AUTHORITY

SEC. 159. (a) Nothing in this part shall preclude or deny any State or political subdivision thereof from adopting or enforcing any requirement respecting the control of any substance, practice, process, or activity for purposes of protecting the stratosphere or ozone in the stratosphere except as otherwise provided in subsection (b).

(b) If a regulation of any substance, practice, process, or activity is in effect under this part in order to prevent or abate any risk to the stratosphere, or ozone in the stratosphere, no State or political subdivision thereof may adopt or attempt to enforce any requirement respecting the control of any such substance, practice, process, or activity to prevent or abate such risk, unless the requirement of the State or political subdivision is identical to the requirement of such regulation. The preceding sentence shall not apply with respect to any law or regulation of any State or political subdivision controlling the use of halocarbons as propellants in aerosol spray containers.

PART C—PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY

SUBPART 1

PURPOSES

SEC. 160. The purposes of this part are as follows:

(1) to protect public health and welfare from any actual or potential adverse effect which in the Administrator's judgment may reasonably be anticipated to occur from air pollution or from exposures to pollutants in other media, which pollutants originate as emissions to the ambient air), notwithstanding attainment and maintenance of all national ambient air quality standards;

(2) to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value;

(3) to insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources;

(4) to assure that emissions from any source in any State will not interfere with any portion of the applicable implementation plan to prevent significant deterioration of air quality for any other State; and

(5) to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decisionmaking process.

PLAN REQUIREMENTS

SEC. 161. In accordance with the policy of section 101 (b)(1), each applicable implementation plan shall contain emission limitations and such other measures as may be necessary, as determined under regulations promulgated under this part, to prevent significant deterioration of air quality in each region (or portion thereof) identified pursuant to section 107(d)(1)(D) or (E).

INITIAL CLASSIFICATIONS

SEC. 162. (a) Upon the enactment of this part, all—

(1) international parks,

(2) national wilderness areas which exceed 5,000 acres in size,

(3) national memorial parks which exceed 5,000 acres in size, and

(4) national parks which exceed six thousand acres in size, and which are in existence on the date of enactment of the Clean Air Act Amendments of 1977 shall be class I areas and may not be redesignated. All areas which were redesignated as class I under regulations promulgated before such date of enactment shall be class I areas which may be redesignated as provided in this part.

(b) All areas in such State identified pursuant to section 107(d)(1)(D) or (E) which are not established as class I under subsection (a) shall be class II areas unless redesignated under section 164.

INCREMENTS AND CEILINGS

SEC. 163. (a) In the case of sulfur oxide and particulate matter, each applicable implementation plan shall contain measures assuring that maximum allowable increases over baseline concentrations of, and maximum allowable concentrations of, such pollutant shall not be exceeded. In the case of any maximum allowable increase (except an allowable increase specified under section 165(d)(2)(C)(iv)) for a pollutant based on concentrations permitted under national ambient air quality standards for any period other than an annual period, such regulations shall permit such maximum allowable increase to be exceeded during one such period per year.

(b)(1) For any class I area, the maximum allowable increase in concentrations of sulfur dioxide and particulate matter over the baseline concentration of such pollutants shall not exceed the following amounts:

Pollutant	Maximum allowable increase (micrograms per cubic meter)
Particulate matter:	
Annual geometric mean	5
Twenty-four-hour maximum	10
Sulfur dioxide:	
Annual arithmetic mean	2
Twenty-four-hour maximum	5
Three-hour maximum	25

(2) For any class II area, the maximum allowable increase in concentrations of sulfur dioxide and particulate matter over the baseline concentration of such pollutants shall not exceed the following amounts:

Pollutant	Maximum allowable increase (micrograms per cubic meter)
Particulate matter:	
Annual geometric mean	19
Twenty-four-hour maximum	37
Sulfur dioxide:	
Annual arithmetic mean	20
Twenty-four-hour maximum	91
Three-hour maximum	512

(3) For any class III area, the maximum allowable increase in concentrations of sulfur dioxide and particulate matter over the baseline concentration of such pollutants shall not exceed the following amounts:

Pollutant	Maximum allowable increase (micrograms per cubic meter)
Particulate matter:	
Annual geometric mean	37
Twenty-four-hour maximum	75
Sulfur dioxide:	
Annual arithmetic mean	40
Twenty-four-hour maximum	182
Three-hour maximum	700

(4) The maximum allowable concentration of any air pollutant in any area to which this part applies shall not exceed a concentration for such pollutant for each period of exposure equal to—

(A) the concentration permitted under the national secondary ambient air quality standard, or

(B) the concentration permitted under the national primary ambient air quality standard,

whichever concentration is lowest for such pollutant for such period of exposure.

(c)(1) In the case of any State which has a plan approved by the Administrator for purposes of carrying out this part, the Governor of such State may, after notice and opportunity for public hearing, issue orders or promulgate rules providing that for purposes of determining compliance with the maximum allowable increases in ambient concentrations of an air pollutant, the

following concentrations of such pollutant shall not be taken into account:

(A) concentrations of such pollutant attributable to the increase in emissions from stationary sources which have converted from the use of petroleum products, or natural gas, or both, by reason of an order which is in effect under the provisions of sections 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (or any subsequent legislation which supersedes such provisions) over the emissions from such sources before the effective date of such order.

(B) the concentrations of such pollutant attributable to the increase in emissions from stationary sources which have converted from using natural gas by reason of a natural gas curtailment pursuant to a natural gas curtailment plan in effect pursuant to the Federal Power Act over the emissions from such sources before the effective date of such plan.

(C) concentrations of particulate matter attributable to the increase in emissions from construction or other temporary emission-related activities, and

(D) the increase in concentrations attributable to new sources outside the United States over the concentrations attributable to existing sources which are included in the baseline concentration determined in accordance with section 169(4).

(2) No action taken with respect to a source under paragraph (1)(A) or (1)(B) shall apply more than five years after the effective date of the order referred to in paragraph (1)(A) or the plan referred to in paragraph (1)(B), whichever is applicable. If both such order and plan are applicable, no such action shall apply more than five years after the later of such effective dates.

(3) No action under this subsection shall take effect unless the Governor submits the order or rule providing for such exclusion to the Administrator and the Administrator determines that such order or rule is in compliance with the provisions of this subsection.

AREA REDESIGNATION

SEC. 164. (a) Except as otherwise provided under subsection (c), a State may redesignate such areas as it deems appropriate as class I areas. The following areas may be redesignated only as class I or II:

(1) an area which exceeds ten thousand acres in size and is a national monument, a national primitive area, a national preserve, a national recreation area, a national wild and scenic river, a national wildlife refuge, a national lakeshore or seashore, and

(2) a national park or national wilderness area es-

tablished after the date of enactment of this Act which exceeds ten thousand acres in size.

Any area (other than an area referred to in paragraph (1) or (2) or an area established as class I under the first sentence of section 162(a)) may be redesignated by the State as class III if—

(A) such redesignation has been specifically approved by the Governor of the State, after consultation with the appropriate Committees of the legislature if it is in session or with the leadership of the legislature if it is not in session (unless State law provides that such redesignation must be specifically approved by State legislation) and if general purpose units of local government representing a majority of the residents of the area so redesignated enact legislation (including for such units of local government resolutions where appropriate) concurring in the State's redesignation;

(B) such redesignation will not cause, or contribute to, concentrations of any air pollutant which exceed any maximum allowable increase or maximum allowable concentration permitted under the classification of any other area; and

(C) such redesignation otherwise meets the requirements of this part.

Subparagraph (A) of this paragraph shall not apply to area redesignations by Indian tribes.

(b)(1)(A) Prior to redesignation of any area under this part, notice shall be afforded and public hearings shall be conducted in areas proposed to be redesignated and in areas which may be affected by the proposed redesignation. Prior to any such public hearing a satisfactory description and analysis of the health, environmental, economic, social, and energy effects of the proposed redesignation shall be prepared and made available for public inspection and prior to any such redesignation, the description and analysis of such effects shall be reviewed and examined by the redesignating authorities.

(B) Prior to the issuance of notice under subparagraph (A) respecting the redesignation of any area under this subsection, if such area includes any Federal lands, the State shall provide written notice to the appropriate Federal land manager and afford adequate opportunity (but not in excess of 60 days) to confer with the State respecting the intended notice of redesignation and to submit written comments and recommendations with respect to such intended notice of redesignation. In redesignating any area under this section with respect to which any Federal land manager has submitted written comments and recommendations, the State shall publish a list of any inconsistency between such redesignation and such recommendations and an explanation of such inconsistency

(together with the reasons for making such redesignation against the recommendation of the Federal land manager).

(C) The Administrator shall promulgate regulations not later than six months after date of enactment of this part, to assure, insofar as practicable, that prior to any public hearing on redesignation of any area, there shall be available for public inspection any specific plans for any new or modified major emitting facility which may be permitted to be constructed and operated only if the area in question is designated or redesignated as class III.

(2) The Administrator may disapprove the redesignation of any area only if he finds, after notice and opportunity for public hearing, that such redesignation does not meet the procedural requirements of this section or is inconsistent with the requirements of section 162(a) or of subsection (a) of this section. If any such disapproval occurs, the classification of the area shall be that which was in effect prior to the redesignation which was disapproved.

(c) Lands within the exterior boundaries of reservations of federally recognized Indian tribes may be redesignated only by the appropriate Indian governing body. Such Indian governing body shall be subject in all respect to the provisions of subsection (e).

(d) The Federal Land Manager shall review all national monuments, primitive areas, and national preserves, and shall recommend any appropriate areas for redesignation as class I where air quality related values are important attributes of the area. The Federal Land Manager shall report such recommendations, within supporting analysis, to the Congress and the affected States within one year after enactment of this section. The Federal Land Manager shall consult with the appropriate States before making such recommendations.

(e) If any State affected by the redesignation of an area by an Indian tribe or any Indian tribe affected by the redesignation of an area by a State disagrees with such redesignation of any area, or if a permit is proposed to be issued for any new major emitting facility proposed for construction in any State which the Governor of an affected State or governing body of an affected Indian tribe determines will cause or contribute to a cumulative change in air quality in excess of that allowed in this part within the affected State or tribal reservation, the Governor or Indian ruling body may request the Administrator to enter into negotiations with the parties involved to resolve such dispute. If requested by any State or Indian tribe involved, the Administrator shall make a recommendation to resolve the dispute and protect the air quality related values of the lands involved. If the

parties involved do not reach agreement, the Administrator shall resolve the dispute and his determination, or the results of agreements reached through other means, shall become part of the applicable plan and shall be enforceable as part of such plan. In resolving such disputes relating to area redesignation, the Administrator shall consider the extent to which the lands involved are of sufficient size to allow effective air quality management or have air quality related values of such an area.

PRECONSTRUCTION REQUIREMENTS

SEC. 165. (a) No major emitting facility on which construction is commenced after the date of the enactment of this part, may be constructed in any area to which this part applies unless—

(1) a permit has been issued for such proposed facility in accordance with this part setting forth emission limitations for such facility which conform to the requirements of this part;

(2) the proposed permit has been subject to a review in accordance with this section, the required analysis has been conducted in accordance with regulations promulgated by the Administrator, and a public hearing has been held with opportunity for interested persons including representatives of the Administrator to appear and submit written or oral presentations on the air quality impact of such source, alternatives thereto, control technology requirements, and other appropriate considerations;

(3) the owner or operator of such facility demonstrates, as required pursuant to section 110(j), that emissions from construction or operation of such facility will not cause, or contribute to, air pollution in excess of any (A) maximum allowable increase or maximum allowable concentration for any pollutant in any area to which this part applies more than one time per year, (B) national ambient air quality standard in any air quality control region, or (C) any other applicable emission standard or standard of performance under this Act;

(4) the proposed facility is subject to the best available control technology for each pollutant subject to regulation under this Act emitted from, or which results from, such facility;

(5) the provisions of subsection (d) with respect to protection of class I areas have been complied with for such facility;

(6) there has been an analysis of any air quality impacts projected for the area as a result of growth associated with such facility;

(7) the person who owns or operates, or proposes to own or operate, a major emitting facility for

which a permit is required under this part agrees to conduct such monitoring as may be necessary to determine the effect which emissions from any such facility may have, or is having, on air quality in any area which may be affected by emissions from such source; and

(8) in the case of a source which proposes to construct in a class III area, emissions from which would cause or contribute to exceeding the maximum allowable increments applicable in a class II area and where no standard under section 111 of this Act has been promulgated subsequent to enactment of the Clean Air Act Amendments of 1977, for such source category, the Administrator has approved the determination of best available technology as set forth in the permit.

(b) The demonstration pertaining to maximum allowable increases required under subsection (a)(3) shall not apply to maximum allowable increases for class II areas in the case of an expansion or modification of a major emitting facility which is in existence on the date of enactment of the Clean Air Act Amendments of 1977, whose allowable emissions of air pollutants, after compliance with subsection (a)(4), will be less than fifty tons per year and for which the owner or operator of such facility demonstrates that emissions of particulate matter and sulfur oxides will not cause or contribute to ambient air quality levels in excess of the national secondary ambient air quality standard for either of such pollutants.

(c) Any completed permit application under section 110 for a major emitting facility in any area to which this part applies shall be granted or denied not later than one year after the date of filing of such completed application.

(d)(1) Each State shall transmit to the Administrator a copy of each permit application relating to a major emitting facility received by such State and provide notice to the Administrator of every action related to the consideration of such permit.

(2)(A) The Administrator shall provide notice of the permit application to the Federal Land Manager and the Federal official charged with direct responsibility for management of any lands within a class I area which may be affected by emissions from the proposed facility.

(B) The Federal Land Manager and the Federal official charged with direct responsibility for management of such lands shall have an affirmative responsibility to protect the air quality related values (including visibility) of any such lands within a class I area and to consider, in consultation with the Administrator, whether a proposed major emitting facility will have an adverse impact on such values.

(C)(i) In any case where the Federal official charged with direct responsibility for management of any lands within a class I area or the Federal Land Manager of such lands, or the Administrator, or the Governor of an adjacent State containing such a class I area files a notice alleging that emissions from a proposed major emitting facility may cause or contribute to a change in the air quality in such area and identifying the potential adverse impact of such change, a permit shall not be issued unless the owner or operator of such facility demonstrates that emissions of particulate matter and sulfur dioxide will not cause or contribute to concentrations which exceed the maximum allowable increases for a class I area.

(ii) In any case where the Federal Land Manager demonstrates to the satisfaction of the State that the emissions from such facility will have an adverse impact on the air quality-related values (including visibility) of such lands, notwithstanding the fact that the change in air quality resulting from emissions from such facility will not cause or contribute to concentrations which exceed the maximum allowable increases for a class I area, a permit shall not be issued.

(iii) In any case where the owner or operator of such facility demonstrates to the satisfaction of the Federal Land Manager, and the Federal Land Manager so certifies, that the emissions from such facility will have no adverse impact on the air quality-related values of such lands (including visibility) notwithstanding the fact that the change in air quality resulting from emissions from such facility will cause or contribute to concentrations which exceed the maximum allowable increases for class I areas, the State may issue a permit.

(iv) In the case of a permit issued pursuant to clause (iii), such facility shall comply with such emission limitations under such permit as may be necessary to assure that emissions of sulfur oxides and particulates from such facility will not cause or contribute to concentrations of such pollutant which exceed the following maximum allowable increases over the baseline concentration for such pollutants:

	Maximum allowable increase (micrograms per cubic meter)
Particulate matter:	
Annual geometric mean	19
Twenty-four-hour maximum	37
Sulfur dioxide:	
Annual arithmetic mean	20
Twenty-four-hour maximum	91
Three-hour maximum	325

(D)(i) In any case where the owner or operator of a proposed major emitting facility who has been denied a certification under subparagraph (C)(iii) demonstrates to the satisfaction of the Governor, after notice and public hearing, and the Governor finds, that the facility cannot be constructed by reason of any maximum allowable

increase for sulfur dioxide for periods of twenty-four hours or less applicable to any class I area and, in the case of Federal mandatory class I areas, that a variance under this clause will not adversely affect the air quality related values of the area (including visibility), the Governor, after consideration of the Federal Land Manager's recommendation (if any) and subject to his concurrence, may grant a variance from such maximum allowable increase. If such variance is granted, a permit may be issued to such source pursuant to the requirements of this subparagraph.

(ii) In any case in which the Governor recommends a variance under this subparagraph in which the Federal Land Manager does not concur, the recommendations of the Governor and the Federal Land Manager shall be transmitted to the President. The President may approve the Governor's recommendation if he finds that such variance is in the national interest. No Presidential finding shall be reviewable in any court. The variance shall take effect if the President approves the Governor's recommendations. The President shall approve or disapprove such recommendation within ninety days after his receipt of the recommendations of the Governor and the Federal Land Manager.

(iii) In the case of a permit issued pursuant to this subparagraph, such facility shall comply with such emission limitations under such permit as may be necessary to assure that emissions of sulfur oxides from such facility will not (during any day on which the otherwise applicable maximum allowable increases are exceeded) cause or contribute to concentrations which exceed the following maximum allowable increases for such areas over the baseline concentration for such pollutant and to assure that such emissions will not cause or contribute to concentrations which exceed the otherwise applicable maximum allowable increases for periods of exposure of 24 hours or less on more than 18 days during any annual period:

Maximum allowable increase

Period of exposure:	*Micrograms per cubic meter*
Low terrain areas:	
24-hr maximum	36
3-hr maximum	130
High terrain areas:	
24-hr maximum	62
3-hr maximum	221

(iv) For purposes of clause (iii), the term "high terrain area" means with respect to any facility, any area having an elevation of 900 feet or more above the base of the stack of such facility, and the term "low terrain area" means any area other than a high terrain area.

(e)(1) The review provided for in subsection (a) shall be preceded by an analysis in accordance with regulations of the Administrator, promulgated under this subsection, which may be conducted by the State (or any general purpose unit of local government) or by the major emitting facility applying for such permit, of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under this Act which will be emitted from such facility.

(2) Effective one year after date of enactment of this part, the analysis required by this subsection shall include continuous air quality monitoring data gathered for purposes of determining whether emissions from such facility will exceed the maximum allowable increases or the maximum allowable concentration permitted under this part. Such data shall be gathered over a period of one calendar year preceding the date of application for a permit under this part unless the State, in accordance with regulations promulgated by the Administrator, determines that a complete and adequate analysis for such purposes may be accomplished in a shorter period. The results of such analysis shall be available at the time of the public hearing on the application for such permit.

(3) The Administrator shall within six months after the date of enactment of this part promulgate regulations respecting the analysis required under this subsection which regulations—

(A) shall not require the use of any automatic or uniform buffer zone or zones,

(B) shall require an analysis of the ambient air quality, climate and meteorology, terrain, soils and vegetation, and visibility at the site of the proposed major emitting facility and in the area potentially affected by the emissions from such facility for each pollutant regulated under this Act which will be emitted from, or which results from the construction or operation of, such facility, the size and nature of the proposed facility, the degree of continuous emission reduction which could be achieved by such facility, and such other factors as may be relevant in determining the effect of emissions from a proposed facility on any air quality control region,

(C) shall require the results of such analysis shall be available at the time of the public hearing on the application for such permit, and

(D) shall specify with reasonable particularity each air quality model or models to be used under specified sets of conditions for purposes of this part.

Any model or models designated under such regulations may be adjusted upon a determination, after notice and

opportunity for public hearing, by the Administrator that such adjustment is necessary to take into account unique terrain or meteorological characteristics of an area potentially affected by emissions from a source applying for a permit required under this part.

OTHER POLLUTANTS

SEC. 166. (a) In the case of the pollutants hydrocarbons, carbon monoxide, photochemical oxidants, and nitrogen oxides, the Administrator shall conduct a study and not later than two years after the date of enactment of this part, promulgate regulations to prevent the significant deterioration of air quality which would result from the emissions of such pollutants. In the case of pollutants for which national ambient air quality standards are promulgated after the date of the enactment of this part, he shall promulgate such regulations not more than 2 years after the date of promulgation of such standards.

(b) Regulations referred to in subsection (a) shall become effective one year after the date of promulgation. Within 21 months after such date of promulgation such plan revision shall be submitted to the Administrator who shall approve or disapprove the plan within 25 months after such date or promulgation in the same manner as required under section 110.

(c) Such regulations shall provide specific numerical measures against which permit applications may be evaluated, a framework for stimulating improved control technology, protection of air quality values, and fulfill the goals and purposes set forth in section 101 and section 160.

(d) The regulations of the Administrator under subsection (a) shall provide specific measures at least as effective as the increments established in section 163 to fulfill such goals and purposes, and may contain air quality increments, emission density requirements, or other measures.

(e) With respect to any air pollutant for which a national ambient air quality standard is established other than sulfur oxides or particulate matter, an area classification plan shall not be required under this section if the implementation plan adopted by the State and submitted for the Administrator's approval or promulgated by the Administrator under section 110(c) contains other provisions which when considered as a whole, the Administrator finds will carry out the purposes in section 160 at least as effectively as an area classification plan for such pollutant. Such other provisions referred to in the preceding sentence need not require the establishment of maximum allowable increases with respect to such pollutant for any area to which this section applies.

ENFORCEMENT

SEC. 167. The Administrator shall, and a State may, take such measures, including issuance of an order, or seeking injunctive relief, as necessary to prevent the construction of a major emitting facility which does not conform to the requirements of this part, or which is proposed to be constructed in any area included in the list promulgated pursuant to paragraph (1)(D) or (E) of subsection (d) of section 107 of this Act and which is not subject to an implementation plan which meets the requirements of this part.

PERIOD BEFORE PLAN APPROVAL

SEC. 168. (a) Until such time as an applicable implementation plan is in effect for any area, which plan meets the requirements of this part to prevent significant deterioration of air quality with respect to any air pollutant, applicable regulations under this Act prior to enactment of this part shall remain in effect to prevent significant deterioration of air quality in any such area for any such pollutant except as otherwise provided in subsection (b).

(b) If any regulation in effect prior to enactment of this part to prevent significant deterioration of air quality would be inconsistent with the requirements of section 162(a), section 163(b) or section 164(a), then such regulations shall be deemed amended so as to conform with such requirements. In the case of a facility on which construction was commenced (in accordance with this definition of "commenced" in section 169(2)) after June 1, 1975, and prior to the enactment of the Clean Air Act Amendments of 1977, the review and permitting of such facility shall be in accordance with the regulations for the prevention of significant deterioration in effect prior to the enactment of the Clean Air Act Amendments of 1977.

DEFINITIONS

SEC. 169. For purposes of this part—

(1) The term "major emitting facility" means any of the following stationary sources of air pollutants which emit, or have the potential to emit, one hundred tons per year or more of any air pollutant from the following types of stationary sources: fossil-fuel fired steam electric plants of more than two hundred and fifty million British thermal units per hour heat input, coal cleaning plants (thermal dryers), kraft pulp mills, Portland Cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of

charging more than two hundred and fifty tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process) primary lead smelters, fuel conversion plants, sintering plants, secondary metal production facilities, chemical process plants, fossil-fuel boilers of more than two hundred and fifty million British thermal units per hour heat input, petroleum storage and transfer facilities with a capacity exceeding three hundred thousand barrels, taconite ore processing facilities, glass fiber processing plants, charcoal production facilities. Such term also includes any other source with the potential to emit two hundred and fifty tons per year or more of any air pollutant. This term shall not include new or modified facilities which are nonprofit health or education institutions which have been exempted by the State.

(2)(A) The term "commenced" as applied to construction of a major emitting facility means that the owner or operator has obtained all necessary preconstruction approvals or permits required by Federal, State, or local air pollution emissions and air quality laws or regulations and either has (i) begun, or caused to begin, a continuous program of physical on-site construction of the facility or (ii) entered into binding agreements or contractual obligations, which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a program of construction of the facility to be completed within a reasonable time.

(B) The term "necessary preconstruction approvals or permits" means those permits or approvals required by the permitting authority as a precondition to undertaking any activity under clauses (i) or (ii) of subparagraph (A) of this paragraph.

(C) The term "construction" when used in connection with any source or facility, includes the modification (as defined in section 111(a)) of any source or facility.

(3) The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning or treatment or

innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section 111 or 112 of this Act.

(4) The term "baseline concentration" means, with respect to a pollutant, the ambient concentration levels which exist at the time of the first application for a permit in an area subject to this part, based on air quality data available in the Environmental Protection Agency or a State air pollution control agency and on such monitoring data as the permit applicant is required to submit. Such ambient concentration levels shall take into account all projected emissions in, or which may affect, such area from any major emitting facility on which construction commenced prior to January 6, 1975, but which has not begun operation by the date of the baseline air quality concentration determination. Emissions of sulfur oxides and particulate matter from any major emitting facility on which construction commenced after January 6, 1975, shall not be included in the baseline and shall be counted against the maximum allowable increases in pollutant concentrations established under this part.

SUBPART 2

VISIBILITY PROTECTION FOR FEDERAL CLASS I AREAS

SEC. 169A. (a)(1) Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.

(2) Not later than six months after the date of the enactment of this section, the Secretary of the Interior in consultation with other Federal land managers shall review all mandatory class I Federal areas and identify those where visibility is an important value of the area. From time to time the Secretary of the Interior may revise such identifications. Not later than one year after such date of enactment, the Administrator shall, after consultation with the Secretary of the Interior, promulgate a list of mandatory class I Federal areas in which he determines visibility is an important value.

(3) Not later than eighteen months after the date of enactment of this section, the Administrator shall complete a study and report to Congress on available methods for implementing the national goal set forth in paragraph (1). Such report shall include recommendations for—

(A) methods for identifying, characterizing, determining, quantifying, and measuring visibility impairment in Federal areas referred to in paragraph (1), and

(B) modeling techniques (or other methods) for determining the extent to which manmade air pollution may reasonably be anticipated to cause or contribute to such impairment, and

(C) methods for preventing and remedying such manmade air pollution and resulting visibility impairment.

Such report shall also identify the classes or categories of sources and the types of air pollutants which, alone or in conjunction with other sources or pollutants, may reasonably be anticipated to cause or contribute significantly to impairment of visibility.

(4) Not later than twenty-four months after the date of enactment of this section, and after notice and public hearing, the Administrator shall promulgate regulations to assure (A) reasonable progress toward meeting the national goal specified in paragraph (1), and (B) compliance with the requirements of this section.

(b) Regulations under subsection (a)(4) shall—

(1) provide guidelines to the States, taking into account the recommendations under subsection (a)(3) on appropriate techniques and methods for implementing this section (as provided in subparagraphs (A) through (C) of such subsection (a)(3)), and

(2) require each applicable implementation plan for a State in which any area listed by the Administrator under subsection (a)(2) is located (or for a State the emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area) to contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal specified in subsection (a), including—

(A) except as otherwise provided pursuant to subsection (c), a requirement that each major stationary source which is in existence on the date of enactment of this section, but which has not been in operation for more than fifteen years as of such date, and which, as determined by the State (or the Administrator in the case of a plan promulgated under section 110(c)) emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area, shall procure, install, and operate, as expeditiously as practicable (and maintain thereafter) the best

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available retrofit technology, as determined by the State (or the Administrator in the case of a plan promulgated under section 110(c)) for controlling emissions from such source for the purpose of eliminating or reducing any such impairment, and

(B) a long-term (ten to fifteen years) strategy for making reasonable progress toward meeting the national goal specified in subsection (a).

In the case of a fossil-fuel fired generating powerplant having a total generating capacity in excess of 750 megawatts, the emission limitations required under this paragraph shall be determined pursuant to guidelines, promulgated by the Administrator under paragraph (1).

(c)(1) The Administrator may, by rule, after notice and opportunity for public hearing, exempt any major stationary source from the requirement of subsection (b)(2)(A), upon his determination that such source does not or will not, by itself or in combination with other sources, emit any air pollutant which may reasonably be anticipated to cause or contribute to a significant impairment of visibility in any mandatory class I Federal area.

(2) Paragraph (1) of this subsection shall not be applicable to any fossil-fuel fired powerplant with total design capacity of 750 megawatts or more, unless the owner or operator of any such plant demonstrates to the satisfaction of the Administrator that such powerplant is located at such distance from all areas listed by the Administrator under subsection (a)(2) that such powerplant does not or will not, by itself or in combination with other sources, emit any air pollutant which may reasonably be anticipated to cause or contribute to significant impairment of visibility in any such area.

(3) An exemption under this subsection shall be effective only upon concurrence by the appropriate Federal land manager or managers with the Administrator's determination under this subsection.

(d) Before holding the public hearing on the proposed revision of an applicable implementation plan to meet the requirements of this section, the State (or the Administrator, in the case of a plan promulgated under section 110(c)) shall consult in person with the appropriate Federal land manager or managers and shall include a summary of the conclusions and recommendations of the Federal land managers in the notice to the public.

(e) In promulgating regulations under this section, the Administrator shall not require the use of any automatic or uniform buffer zone or zones.

(f) For purposes of section 304(a)(2), the meeting of the national goal specified in subsection (a)(1) by any specific date or dates shall not be considered a "nondiscretionary duty" of the Administrator.

(g) For the purpose of this section—

(1) in determining reasonable progress there shall be taken into consideration the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements;

(2) in determining best available retrofit technology the State (or the Administrator in determining emission limitations which reflect such technology) shall take into consideration the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology;

(3) the term "manmade air pollution" means air pollution which results directly or indirectly from human activities;

(4) the term "as expeditiously as practicable" means as expeditiously as practicable but in no event later than five years after the date of approval of a plan revision under this section (or the date of promulgation of such a plan revision in the case of action by the Administrator under section 110(c) for purposes of this section);

(5) the term "mandatory class I Federal areas" means Federal areas which may not be designated as other than class I under this part;

(6) the terms "visibility impairment" and "impairment of visibility" shall include reduction in visual range and atmospheric discoloration; and

(7) the term "major stationary source" means the following types of stationary sources with the potential to emit 250 tons or more of any pollutant; fossil-fuel fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (thermal dryers), kraft pulp mills, Portland Cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black

plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production facilities, chemical process plants, fossil-fuel boilers of more than 250 million British thermal units per hour heat input, petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels, taconite ore processing facilities, glass fiber processing plants, charcoal production facilities.

PART D—PLAN REQUIREMENTS FOR NONATTAINMENT AREAS

DEFINITIONS

SEC. 171. For the purpose of this part and section 110(a)(2)(I)—

(1) The term "reasonable further progress" means annual incremental reductions in emissions of the applicable air pollutant (including substantial reductions in the early years following approval or promulgation of plan provisions under this part and section 110(a)(2)(I) and regular reductions thereafter) which are sufficient in the judgment of the Administrator, to provide for attainment of the applicable national ambient air quality standard by the date required in section 172(a).

(2) The term "nonattainment area" means, for any air pollutant an area which is shown by monitored data or which is calculated by air quality modeling (or other methods determined by the Administrator to be reliable) to exceed any national ambient air quality standard for such pollutant. Such term includes any area identified under subparagraphs (A) through (C) of section 107(d)(1).

(3) The term "lowest achievable emission rate" means for any source, that rate of emissions which reflects—

(A) the most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstartes that such limitations are not achievable, or

(B) the most stringent emission limitation which is achieved in practice by such class or category of source, whichever is more stringent. In no event shall the application of this term permit a proposed new or modified source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance.

(4) The terms "modifications" and "modified" mean the same as the term "modification" as used in section 111(a)(4) of this Act.

NONATTAINMENT PLAN PROVISIONS

SEC. 172. (a)(1) The provisions of an applicable implementation plan for a State relating to attainment and maintenance of national ambient air quality standards in any nonattainment area which are required by section 110(a)(2)(I) as precondition for the construction or modification of any major stationary source in any such area on or after July 1, 1979, shall provide for attainment of each such national ambient air quality standard in each such area as expeditiously as practicable, but, in the case of national primary ambient air quality standards, not later than December 31, 1982.

(2) In the case of the national primary ambient air quality standard for photochemical oxidants or carbon monoxide (or both) if the State demonstrates to the satisfaction of the Administrator (on or before the time required for submission of such plan) that such attainment is not possible in an area with respect to either or both of such pollutants within the period prior to December 31, 1982, despite the implementation of all reasonably available measures, such provisions shall provide for the attainment of the national primary standard for the pollutant (or pollutants) with respect to which such demonstration is made, as expeditiously as practicable but not later than December 31, 1987.

(b) The plan provisions required by subsection (a) shall—

(1) be adopted by the State (or promulgated by the Administrator under section 110(c)) after reasonable notice and public hearing;

(2) provide for the implementation of all reasonably availnable control measures as expeditiously as practicable;

(3) require, in the interim, reasonable further progress (as defined in section 171(1)) including such reduction in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology;

(4) include a comprehensive, accurate, current inventory of actual emissions from all sources (as provided by rule of the Administrator) of each such pollutant for each such area which is revised and resubmitted as frequently as may be necessary to assure that the requirements of paragraph (3) are met and to assess the need for additional reductions to assure attainment of each standard by the date required under subsection (a);

(5) expressly identify and quantify the emissions, if any, of any such pollutant which will be allowed to result from the construction and operation of major new or modified stationary sources for each such area;

(6) require permits for the construction and operation of new or modified major stationary sources in accordance with section 173 (relating to permit requirements);

(7) identify and commit the financial and manpower resources necessary to carry out the plan provisions required by this subsection;

(8) contain emission limitations, schedules of compliance and such other measures as may be necessary to meet the requirements of this section;

(9) evidence public, local government, and State legislative involvement and consultation in accordance with section 174 (relating to planning procedures) and include (A) an identification and analysis of the air quality, health, welfare, economic, energy, and social effects of the plan provisions required by this subsection and of the alternatives considered by the State, and (B) a summary of the public comment on such analysis;

(10) include written evidence that the State, the general purpose local government or governments, or a regional agency designated by general purpose local governments for such purpose, have adopted by statute, regulation, ordinance, or other legally enforceable document, the necessary requirements and schedules and timetables for compliance, and are committed to implement and enforce the appropriate elements of the plan;

(11) in the case of plans which make a demonstration pursuant to paragraph (2) of subsection (a)—

(A) establish a program which requires, prior to issuance of any permit for construction or modification of a major emitting facility, an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source which demonstrates that benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification;

(B) establish a specific schedule for implementation of a vehicle emission control inspection and maintenance program; and

(C) identify other measures necessary to provide for attainment of the applicable national ambient air quality standard not later than December 31, 1987.

(c) In the case of a State plan revision required under the Clean Air Act Amendments of 1977 to be submitted before July 1, 1982, by reason of a demonstration under subsection (a)(2), effective on such date such plan shall contain enforceable measures to assure attainment of the applicable standard not later than December 31, 1987.

PERMIT REQUIREMENTS

SEC. 173. The permit program required by section 172(b)(6) shall provide that permits to construct and operate may be issued if—

(1) the permitting agency determines that—

(A) by the time the source is to commence operation, total allowable emissions from existing sources in the region, from new or modified sources which are not major emitting facilities, and from the proposed source will be sufficiently less than total emissions from existing sources allowed under the applicable implementation plan prior to the application for such permit to construct or modify so as to represent (when considered together with the plan provisions required under section 172) reasonable further progress (as defined in section 171); or

(B) that emissions of such pollutant resulting from the proposed new or modified major stationary source will not cause or contribute to emissions levels which exceed the allowance permitted for such pollutant for such area from new or modified major stationary sources under section 172(b);

(2) the proposed source is required to comply with the lowest achievable emission rate;

(3) the owner or operator of the proposed new or modified source has demonstrated that all major stationary sources owned or operated by such person (or by any entity controlling, controlled by, or under common control with such person) in such State are subject to emission limitations and are in compliance, or on a schedule for compliance, with all applicable emission limitations and standards under this Act; and

(4) the applicable implementation plan is being carried out for the nonattainment area in which the proposed source is to be constructed or modified in accordance with the requirements of this part.

Any emission reductions required as a precondition of the issuance of a permit under paragraph (1)(A) shall be legally binding before such permit may be issued.

PLANNING PROCEDURES

SEC. 174. (a) Within six months after the enactment of the Clean Air Act Amendments of 1977, for each region in which the national primary ambient air quality standard for carbon monoxide or photochemical oxidants will not be attained by July 1, 1979, the State and elected officials of affected local governments shall jointly deter-

mine which elements of a revised implementation plan will be planned for and implemented or enforced by the State and which such elements will be planned for and implemented or enforced by local governments or regional agencies, or any combination of local governments, regional agencies, or the State. Where possible within the time required under this subsection, the implementation plan required by this part shall be prepared by an organization of elected officials of local governments designated by agreement of the local governments in an affected area, and certified by the State for this purpose. Where such an organization has not been designated by agreement within six months after the enactment of the Clean Air Act Amendments of 1977, the Governor (or, in the case of an interstate area, Governors), after consultation with elected officials of local governments, and in accordance with the determination under the first sentence of this subparagraph, shall designate an organization of elected officials of local governments in the affected area or a State agency to prepare such plan. Where feasible, such organization shall be the metropolitan planning organization designated to conduct the continuing, cooperative and comprehensive transportation planning process for the area under section 134 of title 23, United States Code, or the organization responsible for the air quality maintenance planning process under regulations implementing this section, or the organization with both responsibilities.

(b) The preparation of implementation plan provisions under this part shall be coordinated with the continuing, cooperative, and comprehensive transportation planning process required under section 134 of title 23, United States Code, and the air quality maintenance planning process required under section 110, and such planning processes shall take into account the requirements of this part.

ENVIRONMENTAL PROTECTION AGENCY GRANTS

SEC. 175. (a) The Administrator shall make grants to any organization of local elected officials with transportation or air quality maintenance planning responsibilities recognized by the State under section 174(a) for payment of the reasonable costs of developing a plan revision under this part.

(b) The amount granted to any organization under subsection (a) shall be 100 percent of any additional costs of developing a plan revision under this part for the first two fiscal years following receipt of the grant under this paragraph, and shall supplement any funds available under Federal law to such organization for transportation or air quality maintenance planning. Grants under this section shall not be used for construction.

LIMITATIONS ON CERTAIN FEDERAL ASSISTANCE

SEC. 176. (a) The Administrator shall not approve any projects or award any grants authorized by this Act and the Secretary of Transportation shall not approve any projects or award any grants under title 23, United States Code, other than for safety, mass transit, or transportation improvement projects related to air quality improvement or maintenance, in any air quality control region—

(1) in which any national primary ambient air quality standard has not been attained,

(2) where transportation control measures are necessary for the attainment of such standard, and

(3) where the Administrator finds after July 1, 1979, that the Governor has not submitted an implementation plan which considers each of the elements required by section 172 or that reasonable efforts toward submitting such an implementation plan are not being made (or, after July 1, 1982, in the case of an implementation plan revision required under section 172 to be submitted before July 1, 1982).

(b) In any area in which the State or, as the case may be, the general purpose local government or governments or any regional agency designated by such general purpose local governments for such purpose, is not implementing any requirement of an approved or promulgated plan under section 110, including any requirement for a revised implementation plan under this part, the Administrator shall not make any grants under this Act.

(c) No department, agency, or instrumentality of the Federal Government shall (1) engage in, (2) support in any way or provide financial assistance for, (3) license or permit, or (4) approve, any activity which does not conform to a plan after it has been approved or promulgated under section 110. No metropolitan planning organization designated under section 134 of title 23, United States Code, shall give its approval to any project, program, or plan which does not conform to a plan approved or promulgated under section 110. The assurance of conformity to such a plan shall be an affirmative responsibility of the head of such department, agency, or instrumentality.

(d) Each department, agency, or instrumentality of the Federal Government having authority to conduct or support any program with air-quality related transportation consequences shall give priority in the exercise of such authority, consistent with statutory requirements for allocation among States or other jurisdictions, to the

implementation of those portions of plans prepared under this section to achieve and maintain the national primary ambient air quality standard. This paragraph extends to, but is not limited to, authority exercised under the Urban Mass Transportation Act, title 23 of the United States Code, and the Housing and Urban Development Act.

NEW MOTOR VEHICLE EMISSION STANDARDS IN NONATTAINMENT AREAS

SEC. 177. Notwithstanding section 209(a), any State which has plan provisions approved under this part may adopt and enforce for any model year standards relating to control of emissions from new motor vehicles or new motor vehicle engines and take such other actions as are referred to in section 209(a) respecting such vehicles if—

(1) such standards are identical to the California standards for which a waiver has been granted for such model year, and

(2) California and such State adopt such standards at least two years before commencement of such model year (as determined by regulations of the Administrator).

GUIDANCE DOCUMENTS

SEC. 178. The Administrator shall issue guidance documents under section 108 for purposes of assisting States in implementing requirements of this part respecting the lowest achievable emission rate. Such a document shall be published not later than nine months after the date of enactment of this part and shall be revised at least every two years thereafter.

TITLE II—EMISSION STANDARDS FOR MOVING SOURCES

SHORT TITLE

SEC. 201. This title may be cited as the "National Emission Standards Act."

PART A—MOTOR VEHICLE EMISSION AND FUEL STANDARDS

ESTABLISHMENT OF STANDARDS

SEC. 202. (a) Except as otherwise provided in subsection (b)—

(1) The Administrator shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any

class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare. Such standards shall be applicable to such vehicles and engines for their useful life (as determined under subsection (d), relating to useful life of vehicles for purposes of certification), whether such vehicles and engines are designed as complete systems or incorporate devices to prevent or control such pollution.

(2) Any regulation prescribed under paragraph (1) of this subsection (and any revision thereof) shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.

(3)(A)(i) The Administrator shall prescribe regulations under paragraph (1) of this subsection applicable to emissions of carbon monoxide, hydrocarbons, and oxides of nitrogen from classes or categories of heavy-duty vehicles or engines manufactured during and after model year 1979. Such regulations applicable to such pollutants from such classes or categories of vehicles or engines manufactured during model years 1979 through 1982 shall contain standards which reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the model year to which such standards apply, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated with the application of such technology.

(ii) Unless a different standard is temporarily promulgated as provided in subparagraph (B) or unless the standard is changed as provided in subparagraph (E), regulations under paragraph (1) of this subsection applicable to emissions from vehicles or engines manufactured during and after model year—

(I) 1983, in the case of hydrocarbons and carbon monoxide, shall contain standards which require a reduction of at least 90 per cent, and

(II) 1985, in the case of oxides of nitrogen, shall contain standards which require a reduction of at least 75 per cent,

from the average of the actually measured emissions from heavy-duty gasoline-fueled vehicles or engines, or any class or category thereof, manufactured during the baseline model year.

(iii) The Administrator shall prescribe regulations under paragraph (1) of this subsection applicable to emissions of particulate matter from classes or categories of vehicles manufactured during and after model year 1981 (or during any earlier model year, if practicable). Such regulations shall contain standards which reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the model year to which such standards apply, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated with the application of such technology. Such standards shall be promulgated and shall take effect as expeditiously as practicable taking into account the period necessary for compliance.

(iv) In establishing classes or categories of vehicles or engines for purposes of regulations under this paragraph, the Administrator may base such classes or categories on gross vehicle weight, horsepower, or such other factors as may be appropriate.

(v) For the purpose of this paragraph, the term "baseline model year" means, with respect to any pollutant emitted from any vehicle or engine, or class or category thereof, the model year immediately preceding the model year in which Federal standards applicable to such vehicle or engine, or class or category thereof, first applied with respect to such pollutant.

(B) During the period of June 1 through December 31, 1978, in the case of hydrocarbons and carbon monoxide, or during the period of June 1 through December 31, 1980, in the case of oxides of nitrogen, and during each period of June 1 through December 31 of each third year thereafter, the Administrator may, after notice and opportunity for a public hearing promulgate regulations revising any standard prescribed as provided in subparagraph (A)(ii) for any class or category of heavy-duty vehicles or engines. Such standard shall apply only for the period of three model years beginning four model years after the model year in which such revised standard is promulgated. In revising any standard under this subparagraph for any such three model year period, the Administrator shall determine the maximum degree of emission reduction which can be achieved by means reasonably expected to be available for production of such period and shall prescribe a revised emission standard in accordance with such determination. Such revised standard shall require a reduction of emissions from any standard which applies in the previous model year.

(C) Action revising any standard for any period may be taken by the Administrator under subparagraph (B) only if he finds—

(i) that compliance with the emission standards otherwise applicable for such model year cannot be achieved by technology, processes, operating methods, or other alternatives reasonably expected to be available for production for such model year without increasing cost or decreasing fuel economy to an excessive and unreasonable degree; and

(ii) the National Academy of Sciences has not, pursuant to its study and investigation under subsection (c) issued a report substantially contrary to the findings of the Administrator under clause (i).

(D) A report shall be made to the Congress with respect to any standard revised under subparagraph (B) which shall contain—

(i) a summary of the health effects found, or believed to be associated with, the pollutant covered by such standard,

(ii) an analysis of the cost-effectiveness of other strategies for attaining and maintaining national ambient air quality standards and carrying out regulations under part C of title I (relating to significant deterioration) in relation to the cost-effectiveness for such purposes of standards which, but for such revision, would apply.

(iii) a summary of the research and development efforts and progress being made by each manufacturer for purposes of meeting the standards promulgated as provided in subparagraph (A)(ii) or, if applicable, subparagraph (E), and

(iv) specific findings as to the relative costs of compliance, and relative fuel economy, which may be expected to result from the application for any model year of such revised standard and the application for such model year of the standard, which, but for such revisions, would apply.

(E)(i) The Administrator shall conduct a continuing pollutant specific study concerning the effects of each air pollutant emitted from heavy-duty vehicles or engines and from other sources of mobile source related pollutants on the public health and welfare. The results of such study shall be published in the Federal Register and reported to the Congress

not later than June 1, 1978, in the case of hydrocarbons and carbon monoxide, and June 1, 1980, in the case of oxides of nitrogen, and before June 1 of each third year thereafter.

(ii) On the basis of such study and such other information as available to him (including the studies under section 214), the Administrator may, after notice and opportunity for a public hearing, promulgate regulations under paragraph (1) of this subsection changing any standard prescribed in subparagraph (A)(ii) (or revised under subparagraph (B) or previously changed under this subparagraph). No such changed standard shall apply for any model year before the model year four years after the model year during which regulations containing such changed standard are promulgated.

(F) For purposes of this paragraph, motorcycles and motorcycle engines shall be treated in the same manner as heavy-duty vehicles and engines (except as otherwise permitted under section 206(f)(1)) unless the the Administrator promulgates a rule reclassifying motorcycles as light-duty vehicles within the meaning of this section or unless the Administrator promulgates regulations under subsection (a) applying standards applicable to the emission of air pollutants from motorcycles as a separate class or category. In any case in which such standards are promulgated for such emissions from motorcycles as a separate class or category, the Administrator, in promulgating such standards, shall consider the need to achieve equivalency of emission reductions between motorcycles and other motor vehicles to the maximum extent practicable.

(4)(A) Effective with respect to vehicles and engines manufactured after model year 1978, no emission control device, system, or element of design shall be used in a new motor vehicle or new motor vehicle engine for purposes of complying with standards prescribed under this subsection if such device, system, or element of design will cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation or function.

(B) In determining whether an unreasonable risk exists under subparagraph (A), the Administrator shall consider, among other factors, (i) whether and to what extent the use of any device, system, or element of design causes, increases, reduces, or eliminates emissions of any unregulated pollutants; (ii) available methods for reducing or eliminating any risk to public health, welfare, or safety which may be associated with the use of such device, system, or element of design, and (iii) the availability of other

devices, systems, or elements of design which may be used to conform to standards prescribed under this subsection without causing or contributing to such unreasonable risk. The Administrator shall include in the consideration required by this paragraph all relevant information developed pursuant to section 214.

(5)(A) If the Administrator promulgates final regulations which define the degree of control required and the test procedures by which compliance could be determined for gasoline vapor recovery of uncontrolled emissions from the fueling of motor vehicles, the Administrator shall, after consultation with the Secretary of Transportation with respect to motor vehicle safety, prescribe, by regulation, fill pipe standards for new motor vehicles in order to insure effective connection between such fill pipe and any vapor recovery system which the Administrator determines may be required to comply with such vapor recovery regulations. In promulgating such standards the Administrator shall take into consideration limits on fill pipe diameter, minimum design criteria for nozzle retainer lips, limits on the location of the unleaded fuel restrictors, a minimum access zone surrounding a fill pipe, a minimum pipe or nozzle insertion angle, and such other factors as he deems pertinent.

(B) Regulations prescribing standards under subparagraph (A) shall not become effective until the introduction of the model year for which it would be feasible to implement such standards, taking into consideration the restraints of an adequate leadtime for design and production.

(C) Nothing in subparagraph (A) shall (i) prevent the Administrator from specifying different nozzle and fill neck sizes for gasoline with additives and gasoline without additives or (ii) permit the Administrator to require a specific location, configuration, modeling, or styling of the motor vehicle body with respect to the fuel tank fill neck or fill nozzle clearance envelope.

(D) For the purpose of this paragarph, the term "fill pipe" shall include the fuel tank fill pipe, fill neck, fill inlet, and closure.

(6) The Administrator shall determine the feasibility and desirability of requiring new motor vehicles to utilize onboard hydrocarbon control technology which would avoid the necessity of gasoline vapor recovery of uncontrolled emissions emanating from the fueling of motor vehicles. The Administrator shall compare the costs and effectiveness of such technology to that of implementing and maintaining

vapor recovery systems (taking into consideration such factors as fuel economy, economic costs of such technology, administrative burdens, and equitable distribution of costs). If the Administrator finds that it is feasible and desirable to employ such technology, he shall, after consultation with the Secretary of Transportation with respect to motor vehicle safety, prescribe, by regulation, standards requiring the use of onboard hydrocarbon technology which shall not become effective until the introduction to the model year for which it would be feasible to implement such standards, taking into consideration compliance costs and the restraints of an adequate lead time for design and production.

(b)(1)(A) The regulations under subsection (a) applicable to emissions of carbon monoxide and hydrocarbons from light-duty vehicles and engines manufactured during model years 1977 through 1979 shall contain standards which provide that such emissions from such vehicles and engines may not exceed 1.5 grams per vehicle mile of hydrocarbons and 15.0 grams per vehicle mile of carbon monoxide. The regulations under subsection (a) applicable to emissions of carbon monoxide from light-duty vehicles and engines manufactured during the model year 1980 shall contain standards which provide that such emissions may not exceed 7.0 grams per vehicle mile. The regulations under subsection (a) applicable to emissions of hydrocarbons from light-duty vehicles and engines manufactured during or after model year 1980 shall contain standards which require a reduction of at least 90 percent from emissions of such pollutant allowable under the standards under this section applicable to light-duty vehicles and engines manufactured in model year 1970. Unless waived as provided in paragraph (5), regulations under subsection (a) applicable to emissions of carbon monoxide from light-duty vehicles and engines manufactured during or after the model year 1981 shall contain standards which require a reduction of at least 90 percent from emissions of such pollutant allowable under the standards under this section applicable to light-duty vehicles and engines manufactured in model year 1970.

(B) The regulations under subsection (a) applicable to emissions of oxides of nitrogen from light-duty vehicles and engines manufactured during model years 1977 through 1980 shall contain standards which provide that such emissions from such vehicles and engines may not exceed 2.0 grams per vehicle mile. The regulations under subsection (a) applicable to emissions of oxides of nitrogen from light-duty vehicles and engines manufactured during the model year 1981 and thereafter shall contain standards which provide that such emissions from such vehicles and engines may not exceed 1.0 gram

per vehicle mile. The Administrator shall prescribe standards in lieu of those required by the preceding sentence which provide that emissions of oxides of nitrogen may not exceed 2.0 grams per vehicle mile for any light-duty vehicle manufactured during model years 1981 and 1982 by any manufacturer whose production, by corporate identity, for calendar year 1976 was less than three hundred thousand light-duty motor vehicles worldwide if the Administrator determines that—

(i) the ability of such manufacturer to meet emission standards in the 1975 and subsequent model years was, and is, primarily dependent upon technology developed by other manufacturers and purchased from such manufacturers; and

(ii) such manufacturer lacks the financial resources and technological ability to develop such technology.

(C) Effective with respect to vehicles and engines manufactured after model year 1978 (or in the case of heavy-duty vehicles or engines, such later model year as the Administrator determines is the earliest feasible model year), the test procedure promulgated under paragraph (2) for measurement of evaporative emissions of hydrocarbons shall require that such emissions be measured from the vehicle or engine as a whole. Regulations to carry out this subparagraph shall be promulgated not later than two hundred and seventy days after date of enactment of this subparagraph.

(2) Emission standards under paragraph (1), and measurement techniques on which such standards are based (if not promulgated prior to the date of enactment of the Clear Air Amendments of 1970), shall be prescribed by regulation within 180 days after such date.

(3) For purposes of this part—

(A)(i) The term "model year" with reference to any specific calendar year means the manufacturer's annual production period (as determined by the Administrator) which includes January 1 of such calendar year. If the manufacturer has no annual production period, the term "model year" shall mean the calendar year.

(ii) For the purpose of assuring that vehicles and engines manufactured before the beginning of a model year were not manufactured for purposes of circumventing the effective date of a standard required to be prescribed by subsection (b), the Administrator may prescribe regulations defining "model year" otherwise than as provided in clause (i).

(B) The term "light duty vehicles and engines" means new light duty motor vehicles and new light duty motor vehicle engines, as determined under regulations of the Administrator.

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(C) The term "heavy duty vehicle" means a truck, bus, or other vehicle manufactured primarily for use on the public streets, roads, and highways (not including any vehicle operated exclusively on a rail or rails) which has a gross vehicle weight (as determined under regulations promulgated by the Administrator) in excess of six thousand pounds. Such term includes any such vehicle which has special features enabling off-street or off-highway operation and use.

(4) On July 1 of 1971, and of each year thereafter, the Administrator shall report to the Congress with respect to the development of systems necessary to implement the emission standards established pursuant to this section. Such reports shall include information regarding the continuing effects of such air pollutants subject to standards under this section on the public health and welfare, the extent and progress of efforts being made to develop the necessary systems, the costs associated with development and application of such systems, and following such hearings as he may deem advisable, any recommendations for additional congressional action necessary to achieve the purposes of this Act. In gathering information for the purposes of this paragraph and in connection with any hearing, the provisions of section 307(a) (relating to subpenas) shall apply.

(5)(A) At any time after August 31, 1978, any manufacturer may file an application requesting the waiver for model years 1981 and 1982 of the effective date of the emission standard required by paragraph (1)(A) for carbon monoxide applicable to any model (as determined by the Administration) of light-duty motor vehicles and engines manufactured in such model years. The Administrator shall make his determination with respect to any such application within sixty days after such application is filed with respect to such model. If he determines, in accordance with the provisions of this paragraph, that such waiver should be granted, he shall simultaneously with such determination prescribe by regulation emission standards which shall apply (in lieu of the standards required to be prescribed by paragraph (1)(A) of this subsection) to emissions of carbon monoxide from such model of vehicles or engines manufactured during model years 1981 and 1982.

(B) Any standards prescribed under this paragraph shall not permit emissions of carbon monoixde from vehicles and engines to which such waiver applies to exceed 7.0 grams per vehicle per mile.

(C) Within sixty days after receipt of the application for any such waiver and after public hearing, the Administrator shall issue a decision granting or refusing such waiver. The Administrator may grant such waiver if he

finds that protection of the public health does not require attainment of such 90 percent reduction for carbon monoxide for the model years to which such waiver applies in the case of such vehicles and engines and if he determines that—

(i) such waiver is essential to the public interest or the public health and welfare of the United States;

(ii) all good faith efforts have been made to meet the standards established by this subsection;

(iii) the applicant has established that effective control technology, processes, operating methods, or other alternatives are not available or have not been available with respect to the model in question for a sufficient period of time to achieve compliance prior to the effective date of such standards, taking into consideration costs, driveability, and fuel economy; and

(iv) studies and investigations of the National Academy of Sciences conducted pursuant to subsection (c) and other information available to him has not indicated that technology, processes, or other alternatives are available (within the meaning of clause (iii)) to meet such standards.

(6)(A) Upon the petition of any manufacturer, the Administrator, after notice and opportunity for public hearing, may waive the standard required under subparagraph (B) of paragraph (1) to not exceed 1.5 grams of oxides of nitrogen per vehicle mile for any class or category of light-duty vehicles or engines manufactured by such manufacturer during any period of up to four model years beginning after the model year 1980 if the manufacturer demonstrates that such waiver is necessary to permit the use of an innovative power train technology, or innovative emission control device or system, in such class or category of vehicles or engines and that such technology or system was not utilized by more than 1 percent of the light-duty vehicles sold in the United States in the 1975 model year. Such waiver may be granted only if the Administrator determines—

(i) that such waiver would not endanger public health,

(ii) that there is a substantial likelihood that the vehicles or engines will be able to comply with the applicable standard under this section at the expiration of the waiver, and

(iii) that the technology or system has a potential for long-term air quality benefit and has the potential to meet or exceed the average fuel economy standard applicable under the Energy Policy and Conservation Act upon the expiration of the waiver.

No waiver under this subparagraph granted to any manufacturer shall apply to more than 5 percent of such

manufacturer's production or more than fifty thousand vehicles or engines, whichever is greater.

(B) Upon the petition of any manufacturer, the Administrator, after notice and opportunity for public hearing, may waive the standard required under subparagraph (B) of paragraph (1) to not to exceed 1.5 grams of oxides of nitrogen per vehicle mile for any class or category of light-duty vehicles and engines manufactured by such manufacturer during the four model year period beginning with the model year 1981 if the manufacturer can show that such waiver is necessary to permit the use of diesel engine technology in such class or category of vehicles or engines. Such waiver may be granted if the Administrator determines—

(i) that such waiver will not endanger public health,

(ii) that such waiver will result in significant fuel savings at least equal to the fuel economy standard applicable in each year under the Energy Policy and Conservation Act, and

(iii) that the technology has a potential for long-term air quality benefit and has the potential to meet or exceed the average fuel economy standard applicable under the Energy Policy and Conservation Act at the expiration of the waiver.

(7) The Congress hereby declares and establishes as a research objective, the development of propulsion systems and emission control technology to achieve standards which represent a reduction of at least 90 per centum from the average emissions of oxides of nitrogen actually measured from light-duty motor vehicles manufactured in model year 1971 not subject to any Federal or State emission standard for oxides of nitrogen. The Administrator shall, by regulations promulgated within one hundred and eighty days after enactment of the Clean Air Act Amendments of 1977, require each manufacturer whose sales represent at least 0.5 per centum of light-duty motor vehicle sales in the United States, to build and, on a regular basis, demonstrate the operation of light-duty motor vehicles that meet this research objective, in addition to any other applicable standards or requirements for other pollutants under this Act. Such demonstration vehicles shall be submitted to the Administrator no later than model year 1979 and in each model year thereafter. Such demonstration shall, in accordance with applicable regulations, to the greatest extent possible, (A) be designed to encourage the development of new powerplant and emission control technologies that are fuel efficient, (B) assure that the demonstration vehicles are or could reasonably be expected to be within the productive capability of the manufacturers, and (C) assure the utilization of optimum engine, fuel, and emission control systems.

(c)(1) The Administrator shall undertake to enter into appropriate arrangements with the National Academy of Sciences to conduct a comprehensive study and investigation of the technological feasibility of meeting the emissions standards required to be prescribed by the Administrator by subsection (b) of this section.

(2) Of the funds authorized to be appropriated to the Administrator by this Act, such amounts as are required shall be available to carry out the study and investigation authorized by paragraph (1) of this subsection.

(3) In entering into any arrangement with the National Academy of Sciences for conducting the study and investigation authorized by paragraph (1) of this subsection, the Administrator shall request the National Academy of Sciences to submit semiannual reports on the progress of its study and investigation to the Administrator and the Congress, beginning not later than July 1, 1971, and continuing until such study and investigation is completed.

(4) The Administrator shall furnish to such Academy at its request any information which the Academy deems necessary for the purpose of conducting the investigation and study authorized by paragraph (1) of this subsection. For the purpose of furnishing such information, the Administrator may use any authority he has under this Act (A) to obtain information from any person, and (B) to require such person to conduct such tests, keep such records, and make such reports respecting research or other activities conducted by such person as may be reasonably necessary to carry out this subsection.

(d) The Administrator shall prescribe regulations under which the useful life of vehicles and engines shall be determined for purposes of subsection (a)(1) of this section and section 207. Such regulations shall provide that useful life shall—

(1) in the case of light duty vehicles and light duty vehicle engines, be a period of use of five years or of fifty thousand miles (or the equivalent), whichever first occurs:

(2) in the case of any other motor vehicle or motor vehicle engine (other than motorcycles or motorcycle engines) be a period of use set forth in paragraph (1) unless the Administrator determines that a period of use of greater duration or mileage is appropriate; and

(3) in the case of any motorcycle or motorcycle engine, be a period of use the Administrator shall determine.

(e) In the event a new power source or propulsion system for new motor vehicles or new motor vehicle engines is submitted for certification pursuant to section 206(a), the Administrator may postpone certification until he

has prescribed standards for any air pollutants emitted by such vehicle or engine which in his judgment cause or contribute to, air pollution which may reasonably be anticipated to endanger the public health or welfare but for which standards have not been prescribed under subsection (a).

(f)(1) The high altitude regulation in effect with respect to model year 1977 motor vehicles shall not apply to the manufacture, distribution, or sale of 1978 and later model year motor vehicles. Any future regulation affecting the sale or distribution of motor vehicles or engines manufactured before the model year 1984 in high altitude areas of the country shall take effect no earlier than model year 1981.

(2) Any such future regulation applicable to high altitude vehicles or engines shall not require a percentage of reduction in the emissions of such vehicles which is greater than the required percentage of reduction in emissions from motor vehicles as set forth in section 202(b). This percentage reduction shall be determined by comparing any proposed high altitude emission standards to high altitude emissions from vehicles manufactured during model year 1970. In no event shall regulations applicable to high altitude vehicles manufactured before the model year 1984 established a numerical standard which is more stringent than that applicable to vehicles certified under non-high altitude conditions.

(3) Section 307(d) shall apply to any high altitude regulation referred to in paragraph (2) and before promulgating any such regulation, the Administrator shall consider and make a finding with respect to—

(A) the economic impact upon consumers, individual high altitude dealers, and the automobile industry of any such regulation, including the economic impact which was experienced as a result of the regulation imposed during model year 1977 with respect to high altitude certification requirements;

(B) the present and future availability of emission control technology capable of meeting the applicable vehicle and engine emission requirements without reducing model availability; and

(C) the likelihood that the adoption of such a high altitude regulation will result in any significant improvement in air quality in any area to which it shall apply.

PROHIBITED ACTS

SEC. 203. (a) The following acts and the causing thereof are prohibited—

(1) in the case of a manufacturer of new motor vehicles or new motor vehicle engines for distribution in commerce, the sale, or the offering for sale, or the introduction, or delivery for introduction, into commerce, or (in the case of any person, except as provided by regulation of the Administrator), the importation into the United States, of any new motor vehicle or new motor vehicle engine, manufactured after the effective date of regulations under this part which are applicable to such vehicle or engine unless such vehicle or engine is covered by a certificate of conformity issued (and in effect) under regulations prescribed under this part (except as provided in subsection (b));

(2) for any person to fail or refuse to permit access to or copying of records or to fail to make reports or provide information, required under section 208 or for any person to fail or refuse to permit entry, testing, or inspection authorized under section 206(c);

(3)(A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser; or

(B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles, knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser; or

(4) for any manufacturer of a new motor vehicle or new motor vehicle engine subject to standards prescribed under section 202—

(A) to sell or lease any such vehicle or engine unless such manufacturer has complied with the requirements of section 207 (a) and (b) with respect to such vehicle or engine, and unless a label or tag is affixed to such vehicle or engine in accordance with section 207(c)(3),

(B) to fail or refuse to comply with the requirements of section 207 (c) or (e),

(C) except as provided in subsection (c)(3) of section 207, to provide directly or indirectly in any communication to the ultimate purchaser or any subsequent purchaser that the coverage of any warranty under this Act is conditioned upon use of any part, component, or system manufactured by such manufacturer or any person acting for such manu-

facturer or under his control, or conditioned upon service performed by any such person, or

(D) to fail or refuse to comply with the terms and conditions of the warranty under section 207(a) or (b) with respect to any vehicle.

No action with respect to any element of design referred to in paragraph (3) (including any adjustment or alteration of such element) shall be treated as a prohibited Act under such paragraph (3) if such action is in accordance with section 215. Nothing in paragraph (3) shall be construed to require the use of manufacturer parts in maintaining or repairing any motor vehicle or motor vehicle engine. For the purposes of the preceding sentence, the term "manufacturer parts" means, with respect to a motor vehicle engine, parts produced or sold by the manufacturer of the motor vehicle or motor vehicle engine.

(b)(1) The Administrator may exempt any new motor vehicle or new motor vehicle engine from subsection (a), upon such terms and conditions as he may find necessary for the purpose of research, investigations, studies, demonstrations, or training, or for reasons of national security.

(2) A new motor vehicle or new motor vehicle engine offered for importation or imported by any person in violation of subsection (a) shall be refused admission into the United States, but the Secretary of the Treasury and the Administrator may, by joint regulation, provide for deferring final determination as to admission and authorizing the delivery of such a motor vehicle or engine offered for import to the owner or consignee thereof upon such terms and conditions (including the furnishing of a bond) as may appear to them appropriate to insure that any such motor vehicle or engine will be brought into conformity with the standards, requirements, and limitations applicable to it under this part. The Secretary of the Treasury shall, if a motor vehicle or engine is finally refused admission under this paragraph, cause disposition thereof in accordance with the customs laws unless it is exported, under regulations prescribed by such Secretary, within ninety days of the date of notice of such refusal or such additional time as may be permitted pursuant to such regulations, except that disposition in accordance with the customs laws may not be made in such manner as may result, directly or indirectly, in the sale, to the ultimate consumer, of a new motor vehicle or new motor vehicle engine that fails to comply with applicable standards of the Administrator under this part.

(3) A new motor vehicle or new motor vehicle engine intended solely for export, and so labeled or tagged on the outside of the container and on the vehicle or engine itself, shall be subject to the provisions of subsection (a),

except that if the country which is to receive such vehicle or engine has emission standards which differ from the standards prescribed under section 202, then such vehicle or engine shall comply with the standards of such country which is to receive such vehicle or engine.

(c) Upon application therefor, the Administrator may exempt from section 203(a)(3) any vehicles (or class thereof) manufactured before the 1974 model year from section 203(a)(3)* for the purpose of permitting modifications to the emission control device or system of such vehicle in order to use fuels other than those specified in certification testing under section 206(a)(1), if the Administrator, on the basis of information submitted by the applicant, finds that such modification will not result in such vehicle or engine not complying with standards under section 202 applicable to such vehicle or engine. Any such exemption shall identify (1) the vehicle or vehicles so exempted, (2) the specific nature of the modification, and (3) the person or class of persons to whom the exemption shall apply.

INJUNCTION PROCEEDINGS

SEC. 204. (a) The district courts of the United States shall have jurisdiction to restrain violations of section 203(a).

(b) Actions to restrain such violations shall be brought by and in the name of the United States. In any such action, subpenas for witnesses who are required to attend a district court in any district may run into any other district.

PENALTIES

SEC. 205. Any person who violates paragraph (1), (2), or (4) of section 203(a) or any manufacturer, dealer, or other person who violates paragraph (3)(A) of section 203(a) shall be subject to a civil penalty of not more than $10,000. Any person who violates paragraph (3)(B) of such section 203(a) shall be subject to a civil penalty of not more than $2,500. Any such violation with respect to paragraph (1), (3), or (4) of section 203(a) shall constitute a separate offense with respect to each motor vehicle or motor vehicle engine.

MOTOR VEHICLE AND MOTOR VEHICLE ENGINE COMPLIANCE TESTING AND CERTIFICATION

SEC. 206. (a)(1) The Administrator shall test, or require to be tested in such manner as he deems appropriate, any new motor vehicle or new motor vehicle engine submitted by a manufacturer to determine whether such vehicle or engine conforms with the regula-

* The words "from section 203(a)(3)" are apparently redundant in this sentence.

tions prescribed under section 202 of this Act. If such vehicle or engine conforms to such regulations, the Administrator shall issue a certificate of conformity upon such terms, and for such period (not in excess of one year) as he may prescribe. In the case of any manufacturer of vehicles or vehicle engines whose projected sales in the United States for any model year (as determined by the Administrator) will not exceed three hundred, the regulations prescribed by the Administrator concerning testing by the manufacturer for purposes of determining compliance with regulations under section 202 for the useful life of the vehicle or engine shall not require operation of any vehicle or engine manufactured during such model year for more than five thousand miles or one hundred and sixty hours, respectively, but the Administrator shall apply such adjustment factors as he deems appropriate to assure that each such vehicle or engine will comply during its useful life (as determined under section 202(d)) with the regulations prescribed under section 202 of this Act.

(2) The Administrator shall test any emission control system incorporated in a motor vehicle or motor vehicle engine submitted to him by any person, in order to determine whether such system enables such vehicle or engine to conform to the standards required to be prescribed under section 202(b) of this Act. If the Administrator finds on the basis of such tests that such vehicle or engine conforms to such standards, the Administrator shall issue a verification of compliance with emission standards for such system when incorporated in vehicles of a class of which the tested vehicle is representative. He shall inform manufacturers and the National Academy of Sciences, and make available to the public, the results of such tests. Tests under this paragraph shall be conducted under such terms and conditions (including requirements for preliminary testing by qualified independent laboratories) as the Administrator may prescribe by regulations.

(3)(A) A certificate of conformity may be issued under this section only if the Administrator determines that the manufacturer (or in the case of a vehicle or engine for import, any person) has established to the satisfaction of the Administrator that any emission control device, system, or element of design installed on, or incorporated in, such vehicle or engine conforms to applicable requirements of section 202(a)(4).

(B) The Administrator may conduct such tests and may require the manufacturer (or any such person) to conduct such tests and provide such information as is necessary to carry out subparagraph (A) of this paragraph. Such requirements shall include a requirement for prompt reporting of the emission of any unregulated pollutant from a system, device, or element of design if such

pollutant was not emitted, or was emitted in significantly lesser amounts, from the vehicle or engine without use of the system, device, or element of design.

(b)(1) In order to determine whether new motor vehicles or new motor vehicle engines being manufactured by a manufacturer do in fact conform with the regulations with respect to which the certificate of conformity was issued, the Administrator is authorized to test such vehicles or engines. Such tests may be conducted by the Administrator directly or, in accordance with conditions specified by the Administrator, by the manufacturer.

(2)(A)(i) If, based on tests conducted under paragraph (1) on a sample of new vehicles or engines covered by a certificate of conformity, the Administrator determines that all or part of the vehicles or engines so covered do not conform with the regulations with respect to which the certificate of conformity was issued and with the requirements of section 202(a)(4), he may suspend or revoke such certificate in whole or in part, and shall so notify the manufacturer. Such suspension or revocation shall apply in the case of any new motor vehicles or new motor vehicle engines manufactured after the date of such notification (or manufactured before such date if still in the hands of the manufacturer), and shall apply until such time as the Administrator finds that vehicles and engines manufactured by the manufacturer do conform to such regulations and requirements. If, during any period of suspension or revocation, the Administrator finds that a vehicle or engine actually conforms to such regulations and requirements, he shall issue a certificate of conformity applicable to such vehicle or engine.

(ii) If, based on tests conducted under paragraph (1) on any new vehicle or engine, the Administrator determines that such vehicle or engine does not conform with such regulations, he may suspend or revoke such certificate insofar as it applies to such vehicle or engine until such time as he finds such vehicle or engine actually so conforms with such regulations, and he shall so notify the manufacturer.

(B)(i) At the request of any manufacturer the Administrator shall grant such manufacturer a hearing as to whether the tests have been properly conducted or any sampling methods have been properly applied, and make a determination on the record with respect to any suspension or revocation under subparagraph (A); but suspension or revocation under subparagraph (A) shall not be stayed by reason of such hearing.

(ii) In any case of actual controversy as to the validity of any determination under clause (i), the manufacturer may at any time prior to the 60th day after such determination is made file a petition with the United States court of appeals for the circuit wherein such man-

ufacturer resides or has his principal place of business for a judicial review of such determination. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Administrator or other officer designated by him for that purpose. The Administrator thereupon shall file in the court the record of the proceedings on which the Administrator based his determination, as provided in section 2112 of title 28 of the United States Code.

(iii) If the petitioner applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the proceeding before the Administrator, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Administrator, in such manner and upon such terms and conditions as the court may deem proper. The Administrator may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

(iv) Upon the filing of the petition referred to in clause (ii), the court shall have jurisdiction to review the order in accordance with chapter 7 of title 5, United States Code, and to grant appropriate relief as provided in such chapter.

(c) For purposes of enforcement of this section, officers or employees duly designated by the Administrator, upon presenting appropriate credentials to the manufacturer or person in charge, are authorized (1) to enter, at reasonable times, any plant or other establishment of such manufacturers, for the purpose of conducting tests of vehicles of engines in the hands of the manufacturer, or (2) to inspect at reasonable times, records, files, papers, processes, controls, and facilities used by such manufacturer in conducting tests under regulations of the Administrator. Each such inspection shall be commenced and completed with reasonable promptness.

(d) The Administrator shall by regulation establish methods and procedures for making tests under this section.

(e) The Administrator shall announce in the Federal Register and make available to the public the results of his tests of any motor vehicle or motor vehicle engine submitted by a manufacturer under subsection (a) as promptly as possible after the enactment of the Clean Air Amendments of 1970 and at the beginning of each model year which begins thereafter. Such results shall be described in such nontechnical manner as will reasonably disclose to prospective ultimate purchasers of new motor vehicles and new motor vehicle engines the comparative performance of the vehicles and engines tested in meeting the standards prescribed under section 202 of this Act.

(f)(1) All light duty vehicles and engines manufactured during or after model year 1984 shall comply with the requirements of section 202 of this Act regardless of the altitude at which they are sold.

(2) By October 1, 1978, the Administrator shall report to the Congress on the economic impact and technological feasibility of the requirements found in subparagraph (1) of this subsection. The report is also to evaluate the technological feasibility and the health consequences of separate proportional emission standards for light duty vehicles and engines in high altitude areas that would reflect a comparable percentage of reduction in emissions to that achieved by light duty vehicles and engines in low altitude areas.

(g)(1) In the case of any class or category of heavy-duty vehicles or engines to which a standard promulgated under section 202(a) of this Act applies, except as provided in paragraph (2), a certificate of conformity shall be issued under subsection (a) and shall not be suspended or revoked under subsection (b) for such vehicles or engines manufactured by a manufacturer notwithstanding the failure of such vehicles or engines to meet such standard if such manufacturer pays a nonconformance penalty as provided under regulations promulgated by the Administrator after notice and opportunity for public hearing. In the case of motorcycles to which such a standard applies, such a certificate may be issued notwithstanding such failure if the manufacturer pays such a penalty.

(2) No certificate of conformity may be issued under paragraph (1) with respect to any class or category of vehicle or engine if the degree by which the manufacturer fails to meet any standard promulgated under section 202(a) with respect to such class or category exceeds the percentage determined under regulations promulgated by the Administrator to be practicable. Such regulations shall require such testing of vehicle or engines being produced as may be necessary to determine the percentage of the classes or categories of vehicles or engines which are not in compliance with the regulations with respect to which a certificate of conformity was issued and shall be promulgated not later than one year after the date of enactment of the Clean Air Act Amendments of 1977.

(3) The regulations promulgated under paragraph (1) shall, not later than one year after the date of enactment of the Clean Air Act Amendments of 1977, provide for nonconformance penalties in amounts determined under a formula established by the Administrator. Such penalties under such formula—

(A) may vary from pollutant-to-pollutant;
(B) may vary by class or category or vehicle or engine;
(C) shall take into account the extent to which actual emissions of any air pollutant exceed allowable emissions under the standards promulgated under section 202;
(D) shall be increased periodically in order to create incentives for the development of production vehicles or engines which achieve the required degree of emission reduction; and
(E) shall remove any competitive disadvantage to manufacturers whose engines or vehicles achieve the required degree of emission reduction (including any such disadvantage arising from the application of paragraph (4)).

(4) In any case in which a certificate of conformity has been issued under this subsection, any warranty required under section 207(b)(2) and any action under section 207(c) shall be required to be effective only for the emission levels which the Administrator determines that such certificate was issued and not for the emission levels required under the applicable standard.

(5) The authorities of section 208(a) shall apply, subject to the conditions of section 208(b), for purposes of this subsection.

COMPLIANCE BY VEHICLES AND ENGINES IN ACTUAL USE

SEC. 207. (a)(1) Effective with respect to vehicles and engines manufactured in model years beginning more than 60 days after the date of the enactment of the Clean Air Amendments of 1970, the manufacturer of each new motor vehicle and new motor vehicle engine shall warrant to the ultimate purchaser and each subsequent purchaser that such vehicle or engine is (A) designed, built, and equipped so as to conform at the time of sale with applicable regulations under section 202, and (B) free from defects in materials and workmanship which cause such vehicle or engine to fail to conform with applicable regulations for its useful life (as determined under sec. 202(d)).

(2) In the case of a motor vehicle part or motor vehicle engine part, the manufacturer or rebuilder of such part may certify that use of such part will not result in a failure of the vehicle or engine to comply with emission standards promulgated under section 202. Such certification shall be made only under such regulations as may be promulgated by the Administrator to carry out the purposes of subsection (b). The Administrator shall promulgate such regulations no later than two years following the date of the enactment of this paragraph.

(3) The cost of any part, device, or component of any light-duty vehicle that is designed for emission control and which in the instructions issued pursuant to subsection (c)(3) of this section is scheduled for replacement during the useful life of the vehicle in order to maintain compliance with reglations under section 202 of this Act, the failure of which shall not interfere with the normal performance of the vehicle, and the expected retail price of which, including installation costs, is greater than 2 percent of the suggested retail price of such vehicle, shall be borne or reimbursed at the time of replacement by the vehicle manufacturer and such replacement shall be provided without cost to the ultimate purchaser, subsequent purchaser, or dealer. The term "designed for emission control" as used in the preceding sentence means a catalytic converter, thermal reactor, or other component installed on or in a vehicle for the sole or primary purpose of reducing vehicle emissions (not including those vehicle components which were in general use prior to model year 1968 and the primary function of which is not related to emission control).

(b) If the Administrator determines that (i) there are available testing methods and procedures to ascertain whether, when in actual use throughout its useful life (as determined under section 202(d)), each vehicle and engine to which regulations under section 202 apply complies with the emission standards of such regulations, (ii) such methods and procedures are in accordance with good engineering practices, and (iii) such methods and procedures are reasonably capable of being correlated with tests conducted under section 206(a)(1), then—

(1) he shall establish such methods and procedures by regulation, and

(2) at such time as he determines that inspection facilities or equipment are available for purposes of carrying out testing methods and procedures established under paragraph (1), he shall prescribe regulations which shall require manufacturers to warrant the emission control device or system of each new motor vehicle or new motor vehicle engine to which a regulation under section 202 applies and which is manufactured in a model year beginning after the Administrator first prescribes warranty regulations under this paragraph. The warranty under such regulations shall run to the ultimate purchaser and each subsequent purchaser and shall provide that if—

(A) the vehicle or engine is maintained and operated in accordance with instructions under subsection (c)(3),

(B) it fails to conform at any time during its useful life (as determined under section

202(d)) to the regulations prescribed under section 202, and

(C) such nonconformity results in the ultimate purchaser (or any subsequent purchaser) of such vehicle or engine having to bear any penalty or other sanction (including the denial of the right to use such vehicle or engine) under State or Federal law,

then such manufacturer shall remedy such nonconformity under such warranty with the cost thereof to be borne by the manufacturer. No such warranty shall be invalid on the basis of any part used in the maintenance or repair of a vehicle or engine if such part was certified as provided under subsection (a)(2). For purposes of the warranty under this subsection, for the period after twenty-four months or twenty-four thousand miles (whichever first occurs) the term "emission control device or system" means a catalytic converter, thermal reactor, or other component installed on or in a vehicle for the sole or primary purpose of reducing vehicle emissions. Such terms shall not include those vehicle components which were in general use prior to model year 1968.

(c) Effective with respect to vehicles and engines manufactured during model years beginning more than 60 days after the date of enactment of the Clean Air Amendments of 1970—

(1) If the Administrator determines that a substantial number of any class or category of vehicles or engines, although properly maintained and used, do not conform to the regulations prescribed under section 202, when in actual use throughout their useful life (as determined under section 202(d)), he shall immediately notify the manufacturer thereof of such nonconformity, and he shall require the manufacturer to submit a plan for remedying the nonconformity of the vehicles or engines with respect to which such notification is given. The plan shall provide that the nonconformity of any such vehicles or engines which are properly used and maintained will be remedied at the expense of the manufacturer. If the manufacturer disagrees with such determination of nonconformity and so advises the Administrator, the Administrator shall afford the manufacturer and other interested persons an opportunity to present their views and evidence in support thereof at a public hearing. Unless, as a result of such hearing the Administrator withdraws such determination of nonconformity, he shall, within 60 days after the completion of such hearing, order the manufacturer to provide prompt notification of such nonconformity in accordance with paragraph (2).

(2) Any notification required by paragraph (1) with respect to any class or category of vehicles or engines shall be given to dealers, ultimate purchasers, and subsequent purchasers (if known) in such manner and containing such information as the Administrator may be regulations require.

(3)(A) The manufacturer shall furnish with each new motor vehicle or motor vehicle engine written instructions for the proper maintenance and use of the vehicle or engine by the ultimate purchaser and such instructions shall correspond to regulations which the Administrator shall promulgate. The manufacturer shall provide in boldface type on the first page of the written maintenance instructions notice that maintenance, replacement, or repair of the emission control devices and systems may be performed by any automotive repair establishment or individual using any automotive part which has been certified as provided in subsection (a)(2).

(B) The instruction under subparagraph (A) of this paragraph shall not include any condition on the ultimate purchaser's using, in connection with such vehicle or engine, any component or service (other than a component or service provided without charge under the terms of the purchase agreement) which is identified by brand, trade, or corporate name; or directly or indirectly distinguishing between service performed by the franchised dealers of such manufacturer or any other service establishments with which such manufacturer has a commercial relationship, and service performed by independent automotive repair facilities with which such manufacturer has no commercial relationship; except that the prohibition of this subsection may be waived by the Administrator if—

(i) the manufacturer satisfies the Administrator that the vehicle or engine will function properly only if the component or service so identified is used in connection with such vehicle or engine, and

(ii) the Administrator finds that such a waiver is in the public interest.

(C) In addition, the manufacturer shall indicate by means of a label or tag permanently affixed to such vehicle or engine that such vehicle or engine is covered by a certificate of conformity issued for the purpose of assuring achievement of emissions standards prescribed under section 202 of this Act. Such label or tag shall contain such other information relating to control of motor vehicle emissions as the Administrator shall prescribe by regulation.

(d) Any cost obligation of any dealer incurred as a result of any requirement imposed by subsection (a), (b), or (c) shall be borne by the manufacturer. The transfer of any such cost obligation from a manufacturer

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fuel or fuel additive for use in a motor vehicle or motor vehicle engine (A) if in the judgment of the Administrator any emission product of such fuel or fuel additive causes, or contributes, to air pollution which may reasonably be anticipated to endanger the public health or welfare, or (B) if emission products of such fuel or fuel additive will impair to a significant degree the performance of any emission control device or system which is in general use, or which the Administrator finds has been developed to a point where in a reasonable time it would be in general use were such regulation to be promulgated.

(2)(A) No fuel, class of fuels, or fuel additive may be controlled or prohibited by the Administrator pursuant to clause (A) of paragraph (1) except after consideration of all relevant medical and scientific evidence available to him, including consideration of other technologically or economically feasible means of achieving emission standards under section 202.

(B) No fuel or fuel additive may be controlled or prohibited by the Administrator pursuant to clause (B) of paragraph (1) except after consideration of available scientific and economic data, including a cost benefit analysis comparing emission control devices or systems which are or will be in general use and require the proposed control or prohibition with emission control devices or systems which are or will be in general use and do not require the proposed control or prohibition. On request of a manufacturer of motor vehicles, motor vehicle engines, fuels, or fuel additives submitted within 10 days of notice of proposed rulemaking, the Administrator shall hold a public hearing and publish findings with respect to any matter he is required to consider under this subparagraph. Such findings shall be published at the time of promulgation of final regulations.

(C) No fuel or fuel additive may be prohibited by the Administrator under paragraph (1) unless he finds, and publishes such finding, that in his judgment such prohibition will not cause the use of any other fuel or fuel additive which will produce emissions which will endanger the public health or welfare to the same or greater degree than the use of the fuel or fuel additive proposed to be prohibited.

(3)(A) For the purpose of obtaining evidence and data to carry out parrgraph (2), the Administrator may require the manufacturer of any motor vehicle or motor vehicle engine to furnish any information which has been developed concerning the emissions from motor vehicles resulting from the use of any fuel or fuel additive, or the effect of such use on the performance of any emission control device or system.

(B) In obtaining information under subparagraph (A), section 307 (a) (relating to subpenas) shall be applicable.

(4) (A) Except as otherwise provided in subparagraph (B) or (C), no State (or political subdivision thereof) may prescribe or attempt to enforce, for the purposes of motor vehicle emission control, any control or prohibition respecting use of a fuel or fuel additive in a motor vehicle or motor vehicle engine—

(i) if the Administrator has found that no control or prohibition under paragraph (1) is necessary and has published his finding in the Federal Register, or

(ii) if the Administrator has prescribed under paragraph (1) a control or prohibition applicable to such fuel or fuel additive, unless State prohibition or control is identical to the prohibition or control prescribed by the Administrator.

(B) Any State for which application of section 209(a) has at any time been waived under section 209(b) may at any time prescribe and enforce, for the purpose of motor vehicle emission control, a control or prohibition respecting any fuel or fuel additive.

(C) A State may prescribe and enforce, for purposes of motor vehicle emission control, a control or prohibition respecting the use of a fuel or fuel additive in a motor vehicle or motor vehicle engine if an applicable implementation plan for such State under section 110 so provides. The Administrator may approve such provision in an implementation plan, or promulgate an implementation plan containing such a provision, only if he finds that the State control or prohibition is necessary to achieve the national primary or secondary ambient air quality standard which the plan implements.

(d) Any person who violates subsection (a) or (f) or the regulations prescribed under subsection (c) or who fails to furnish any information required by the Administrator under subsection (b) shall forfeit and pay to the United States a civil penalty of $10,000 for each and every day of the continuance of such violation, which shall accrue to the United States and be recovered in a civil suit in the name of the United States, brought in the district where such person has his principal office or in any district in which he does business. The Administrator may, upon application therefor, remit or mitigate any forfeiture provided for in this subsection and he shall have authority to determine the facts upon all such applications.

(e)(1) Not later than one year after the date of enactment of this subsection and after notice and opportunity for a public hearing, the Administrator shall promulgate regulations which implement the authority under subsection (b)(2) (A) and (B) with respect to each fuel or fuel additive which is registered on the date of promulgation of such regulations and with respect to each fuel or fuel additive for which an application for registration is filed thereafter.

(2) Regulations under subsection (b) to carry out this subsection shall require that the requisite information be provided to the Administrator by each such manufacturer—

(A) prior to registration, in the case of any fuel or fuel additive which is not registered on the date of promulgation of such regulations; or

(B) not later than three years after the date of promulgation of such regulations, in the case of any fuel or fuel additive which is registered on such date.

(3) In promulgating such regulations, the Administrator may—

(A) exempt any small business (as defined in such regulations) from or defer or modify the requirements of, such regulations with respect to any such small business;

(B) provide for cost-sharing with respect to the testing of any fuel or fuel additive which is manufactured or processed by two or more persons or otherwise provide for shared responsibility to meet the requirements of this section without duplication: or

(C) exempt any person from such regulations with respect to a particular fuel or fuel additive upon a finding that any additional testing of such fuel or fuel additive would be duplicative of adequate existing testing.

(f)(1) Effective upon March 31, 1977, it shall be unlawful for any manufacturer of any fuel or fuel additive to first introduce into commerce, or to increase the concentration in use of, any fuel or fuel additive for general use in light duty motor vehicles manufactured after model year 1974 which is not substantially similar to any fuel or fuel additive utilized in the certification of any model year 1975, or subsequent model year, vehicle or engine under section 206.

(2) Effective November 30, 1977, it shall be unlawful for any manufacturer of any fuel to introduce into commerce any gasoline which contains a concentration of manganese in excess of .0625 grams per gallon of fuel, except as otherwise provided pursuant to a waiver under paragraph (4).

(3) Any manufacturer of any fuel or fuel additive which prior to March 31, 1977, and after January 1, 1974, first introduced into commerce or increased the concentration in use of a fuel or fuel additive that would otherwise have been prohibited under paragraph (1) if introduced on or after March 31, 197, shall, not later than September 15, 1978, cease to distribute such fuel or fuel additive in commerce. During the period beginning 180 days after the date of the enactment of this subsection

and before September 15, 1978, the Administrator shall prohibit, or restrict the concentration of any fuel additive which he determines will cause or contribute to the failure of an emission control device or system (over the useful life of any vehicle in which such device or system is used) to achieve compliance by the vehicle with the emission standards with respect to which it has been certified under section 206.

(4) The Administrator, upon application of any manufacturer of any fuel or fuel additive, may waive the prohibitions established under paragraph (1) or (3) of this subsection or the limitation specified in paragraph (2) of this subsection, if he determines that the applicant has established that such fuel or fuel additive or a specified concentration thereof, and the emission products of such fuel or additive or specified concentration thereof, will not cause or contribute to a failure of any emission control device or system (over the useful life of any vehicle in which such device or system is used) to achieve compliance by the vehicle with the emission standards with respect to which it has been certified pursuant to section 206. If the Administrator has not acted to grant or deny an application under this paragraph within one hundred and eighty days of receipt of such application, the waiver authorized by this paragraph shall be treated as granted.

(5) No action of the Administrator under this section may be stayed by any court pending judicial review of such action.

(g)(1) For the purposes of this subsection:

(A) The terms "gasoline" and "refinery" have the meaning provided under regulations of the Administrator promulgated under this section.

(B) The term "small refinery" means a refinery or a portion of refinery producing gasoline—

(i) the gasoline producing capacity of which was in operation or under construction at any time during the one-year period immediately preceding October 1, 1976, and

(ii) which has a crude oil or bona fide feed stock capacity (as determined by the Administrator) of 50,000 barrels per day or less, and

(iii) which is owned or controlled by a refiner with a total combined crude oil or bona fide feed stock capacity (as determined by the Administrator) of 137,500 barrels per day or less.

(2) No regulations of the Administrator under this section (or any amendment or revision thereof) respecting the control or prohibition of lead additives in gasoline shall require a small refinery prior to October 1, 1982, to reduce the average lead content per gallon of

to any dealer through franchise or other agreement is prohibited.

(e) If a manufacturer includes in any advertisement a statement respecting the cost or value of emission control devices or systems, such manufacturer shall set forth in such statement the cost or value attributed to such devices or systems by the Secretary of Labor (through the Bureau of Labor Statistics). The Secretary of Labor, and his representatives, shall have the same access for this purpose to the books, documents, papers, and records of a manufacturer as the Comptroller General has to those of a recipient of assistance for purposes of section 311.

(f) Any inspection of a motor vehicle or a motor vehicle engine for purposes of subsection (c)(1), after its sale to the ultimate purchaser, shall be made only if the owner of such vehicle or engine voluntarily permits such inspection to be made, except as may be provided by any State or local inspection program.

(g) For the purposes of this section, the owner of any motor vehicle or motor vehicle engine warranted under this section is responsible in the proper maintenance of such vehicle or engine to replace and to maintain, at his expense at any service establishment or facility of his choosing, such items as spark plugs, points, condensers, and any other part, item, or device related to emission control (but not designed for emission control under the terms of the last three sentences of section 207(a)(1), unless such part, item, or device is covered by any warranty not mandated by this Act.

(h)(1) Upon the sale of each new light-duty motor vehicle by a dealer, the dealer shall furnish to the purchaser a certificate that such motor vehicle conforms to the applicable regulations under section 202, including notice of the purchaser's rights under paragraph (2).

(2) If at any time during the period for which the warranty applies under subsection (b), a motor vehicle fails to conform to the applicable regulations under section 202 as determined under subsection (b) of this section such nonconformity shall be remedied by the manufacturer at the cost of the manufacturer pursuant to such warranty as provided in section 207(b)(2) (without regard to subparagraph (C) thereof).

(3) Nothing in section 209(a) shall be construed to prohibit a State from testing, or requiring testing of, a motor vehicle after the date of sale of such vehicle to the ultimate purchaser (except that no new motor vehicle manufacturer or dealer may be required to conduct testing under this paragraph).

RECORDS AND REPORTS

SEC. 208. (a) Every manufacturer shall establish and maintain such records, make such reports, and provide

such information as the Administrator may reasonably require to enable him to determine whether such manufacturer has acted or is acting in compliance with this part and regulations thereunder and shall, upon request of an officer or employee duly designated by the Administrator, permit such officer or employee at reasonable times to have access to and copy such records.

(b) Any records, reports or information obtained under subsection (a) shall be available to the public, except that upon a showing satisfactory to the Administrator by any person that records, reports, or information, or particular part thereof (other than emission data), to which the Administrator has access under this section if made public, would divulge methods or processes entitled to protection as trade secrets of such person, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the purposes of section 1905 of title 18 of the United States Code, except that such record, report, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this Act or when relevant in any proceeding under this Act. Nothing in this section shall authorize the withholding of information by the Administrator or any officer or employee under his control from the duly authorized committees of the Congress.

STATE STANDARDS

SEC. 209. (a) No State or any political subdivision thereof shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines subject to this part. No State shall require certification, inspection, or any other approval relating to the control of emissions from any new motor vehicle or new motor vehicle engine as condition precedent to the initial retail sale, titling (if any), or registration of such motor vehicle, motor vehicle engine, or equipment.

(b)(1) The Administrator shall, after notice and opportunity for public hearing, waive application of this section to any State which has adopted standards (other than crankcase emission standards) for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1966, if the State determines that the State standards will be, in the aggregate, at least as protective of public health and welfare as applicable Federal standards. No such waiver shall be granted if the Administrator finds that—

(A) the determination of the State is arbitrary and capricious,

(B) such State does not need such State standards to meet compelling and extraordinary conditions, or

(C) such State standards and accompanying enforcement procedures are not consistent with section 202(a) of this part.

(2) If each State standard is at least as stringent as the comparable applicable Federal standard, such State standard shall be deemed to be at least as protective of health and welfare as such Federal standards for purposes of paragraph (1).

(3) in the case of any new motor vehicle or new motor vehicle engine to which State standards apply pursuant to a waiver granted under paragraph (1), compliance with such State standards shall be treated as compliance with applicable Federal standards for purposes of this title.

(c) Whenever a regulation with respect to any motor vehicle part or motor vehicle engine part is in effect under section 207(a)(2), no State or political subdivision thereof shall adopt or attempt to enforce any standard or any requirement of certification, inspection, or approval which relates to motor vehicle emissions and is applicable to the same aspect of such part. The preceding sentence shall not apply in the case of a State with respect to which a waiver is in effect under subsection (b).

(d) Nothing in this part shall preclude or deny to any State or political subdivision thereof the right otherwise to control, regulate, or restrict the use, operation, or movement of registered or licensed motor vehicles.

STATE GRANTS

SEC. 210. The Administrator is authorized to make grants to appropriate State agencies in an amount up to two-thirds of the cost of developing and maintaining effective vehicle emission devices and systems inspection and emission testing and control programs, except that—

(1) no such grant shall be made for any part of any State vehicle inspection program which does not directly relate to the cost of the air pollution control aspects of such a program;

(2) no such grant shall be made unless the Secretary of Transportation has certified to the Administrator that such program is consistent with any highway safety program developed pursuant to section 402 of title 23 of the United States Code; and

(3) no such grant shall be made unless the program includes provisions designed to insure that emission control devices and systems on vehicles in actual use have not been discontinued or rendered inoperative. Grants may be made under this section by way of reimbursement in any case in which amounts have been expended by the State before the date on which any such grant was made.

REGULATION OF FUELS

SEC. 211. (a) The Administrator may by regulation designate any fuel or fuel additive and, after such date or dates as may be prescribed by him, no manufacturer or processor of any such fuel or additive may sell, offer for sale, or introduce into commerce such fuel or additive unless the Administrator has registered such fuel or additive in accordance with subsection (b) of this section.

(b)(1) For the purpose of registration of fuels and fuel additives, the Administrator shall require—

(A) the manufacturer of any fuel to notify him as to the commercial identifying name and manufacturer of any additive contained in such fuel; the range of concentration of any additive in the fuel; and the purpose-in-use of any such additive; and

(B) the manufacturer of any additive to notify him as to the chemical composition of such additive.

(2) For the purpose of registration of fuels and fuel additives, the Administrator may also require the manufacturer of any fuel or fuel additive—

(A) to conduct tests to determine potential public health effects of such fuel or additive (including, but not limited to, carcinogenic, teratogenic, or mutagenic effects), and

(B) to furnish the description of any analytical technique that can be used to detect and measure any additive in such fuel, the recommended range of concentration of such additive, and the recommended purpose-in-use of such additive, and such other information as is reasonable and necessary to determine the emissions resulting from the use of the fuel or additive contained in such fuel, the effect of such fuel or additive on the emission control performance of any vehicle or vehicle engine, or the extent to which such emissions affect the public health or welfare.

Tests under subparagraph (A) shall be conducted in conformity with test procedures and protocols established by the Administrator. The results of such tests shall not be considered confidential.

(3) Upon compliance with the provisions of this subsection, including assurances that the Administrator will receive changes in the information required, the Administrator shall register such fuel or fuel additive.

(c)(1) The Administrator may, from time to time on the basis of information obtained under subsection (b) of this section or other information available to him, by regulation, control or prohibit the manufacture, introduction into commerce, offering for sale, or sale of any

gasoline refined at such refinery below the applicable amount specified in the table below:

If the average gasoline production of the small refinery for the immediately preceding calendar year (or, in the case of refineries under construction, half the designed crude oil capacity) was (in barrels per day):	*The applicable amount (in grams per gallon)*
5,000 or under	2.65.
5,001 to 10,000	2.15.
10,001 to 15,000	1.65.
15,001 to 20,000	1.30.
20,001 to 25,000	.80.
25,001 or over	As prescribed by the Administrator, but not greater than 0.80.

The Administrator may promulgate such regulations as he deems appropriate with respect to the reduction of the average lead content of gasoline refined by small refineries on and after October 1, 1982, taking into account the experience under the preceding provisions of this paragraph.

(3) Effective on the date of the enactment of this subsection, the regulations of the Administrator under this section respecting fuel additives (40 CFR part 80) shall be deemed amended to comply with the requirement contained in paragraph (2).

(4) Nothing in this section shall be construed to preempt the right of any State to take action as permitted by section 211(c)(4) of this Act.

DEVELOPMENT OF LOW-EMISSION VEHICLES

SEC. 212. (a) For the purpose of this section—

(1) The term "Board" means the Low-Emission Vehicle Certification Board.

(2) The term "Federal Government" includes the legislative, executive, and judicial branches of the Government of the United States, and the government of the District of Columbia.

(3) The term "motor vehicle" means any self-propelled vehicle designed for use in the United States on the highways, other than a vehicle designed or used for military field training, combat, or tactical purposes.

(4) The term "low-emission vehicle" means any motor vehicle which—

(A) emits any air pollutant in amounts significantly below new motor vehicle standards applicable under section 202 at the time of procurement to that type of vehicle; and

(B) with respect to all other air pollutants meets the new motor vehicle standards applicable under section 202 at the time of procurement to that type of vehicle.

(5) The term "retail price" means (A) the maximum statutory price applicable to any class or model of motor vehicle; or (B) in any case where there is no applicable maximum statutory price, the most recent procurement price paid for any class or model of motor vehicle.

(b)(1) There is established a Low-Emission Vehicle Certification Board to be composed of the Administrator or his designee, the Secretary of Transportation or his designee, the Chairman of the Council on Enivornmental Quality or his designee, the Director of the National Highway Safety Bureau in the Department of Transportation, the Administrator of General Services, and two members appointed by the President. The President shall designate one member of the Board as Chairman.

(2) Any member of the Board not employed by the United States may receive compensation at the rate of $125 for each day such member is engaged upon work of the Board. Each member of the Board shall be reimbursed for travel expenses, including per diem in lieu of subsistence as authorized by section 5703 of title 5, United States Code, for persons in the Government service employed intermittently.

(3)(A) The Chairman, with the concurrence of the members of the Board, may employ and fix the compensation of such additional personnel as may be necessary to carry out the functions of the Board, but no individual so appointed shall receive compensation in excess of the rate authorized for GS-18 by section 5332 of title 5, United States Code.

(B) The Chairman may fix the time and place of such meetings as may be required, but a meeting of the Board shall be called whenever a majority of its members so requests.

(C) The Board is granted all other powers necessary for meeting its responsibilities under this section.

(c) The Administrator shall determine which models or classes of motor vehicles qualify as low-emission vehicles in accordance with the provisions of this section.

(d)(1) The Board shall certify any class or model of motor vehicles—

(A) for which a certification application has been filed in accordance with paragraph (3) of this subsection;

(B) which is a low-emission vehicle as determined by the Administrator; and

(C) which it determines is suitable for use as a substitute for a class or model of vehicles at that time in use by agencies of the Federal Government.

The Board shall specify with particularity the class or model of vehicles for which the class or model of vehicles described in the application is a suitable substitute. In making the determination under this subsection the Board shall consider the following criteria:

(i) the safety of the vehicle;
(ii) its performance characteristics;
(iii) its reliability potential;
(iv) its serviceability;
(v) its fuel availability;
(vi) its noise level; and
(vii) its maintenance costs as compared with the class or model of motor vehicle for which it may be a suitable substitute.

(2) Certification under this section shall be effective for a period of one year from the date of issuance.

(3)(A) Any party seeking to have a class or model of vehicle certified under this section shall file a certification application in accordance with regulations prescribed by the Board.

(B) The Board shall publish a notice of each application received in the Federal Register.

(C) The Administrator and the Board shall make determinations for the purpose of this section in accordance with procedures prescribed by regulation by the Administrator and the Board, respectively.

(D) The Administrator and the Board shall conduct whatever investigation is necessary, including actual inspection of the vehicle at a place designated in regulations prescribed under subparagraph (A).

(E) The Board shall receive and evaluate written comments and documents from interested parties in support of, or in opposition to, certification of the class or model of vehicle under consideration.

(F) Within ninety days after the receipt of a properly filed certification application, the Administrator shall determine whether such class or model of vehicles is a low-emission vehicle, and within 180 days of such determination, the Board shall reach a decision by majority vote as to whether such class or model of vehicle, having been determined to be a low-emission vehicle, is a suitable substitute for any class or classes of vehicles presently being purchased by the Federal Government for use by its agencies.

(G) Immediately upon making any determination or decision under subparagraph (F), the Administrator and the Board shall each publish in the Federal Register notice of such determination or decision, including reasons therefor and in the case of the Board any dissenting views.

(e)(1) Certified low-emission vehicles shall be acquired by purchase or lease by the Federal Government

for use by the Federal Government in lieu of other vehicles if the Administrator of General Services determines that such certified vehicles have procurement costs which are no more than 150 per centum of the retail price of the least expensive class or model of motor vehicle for which they are certified substitutes.

(2) In order to encourage development of inherently low-polluting propulsion technology, the Board may, at its discretion, raise the premium set forth in paragraph (1) of this subsection to 200 per centum of the retail price of any class or model of motor vehicle for which a certified low-emission vehicle is a certified substitute, if the Board determines that the certified low-emission vehicle is powered by an inherently low-polluting propulsion system.

(3) Data relied upon by the Board and the Administrator in determining that a vehicle is a certified low-emission vehicle shall be incorporated in any contract for the procurement of such vehicle.

(f) The procuring agency shall be required to purchase available certified low-emission vehicles which are eligible for purchase to the extent they are available before purchasing any other vehicles for which any low-emission vehicle is a certified substitute. In making purchasing selections between competing eligible certified low-emission vehicles, the procuring agency shall give priority to (1) any class or model which does not require extensive periodic maintenance to retain its low-polluting qualities or which does not require the use of fuels which are more expensive than those of the classes or models of vehicles for which it is a certified substitute; and (2) passenger vehicles other than buses.

(g) For the purpose of procuring certified low-emission vehicles any statutory price limitations shall be waived.

(h) The Administrator shall, from time to time as the Board deems appropriate, test the emissions from certified low-emission vehicles purchased by the Federal Government. If at any time he finds that the emission rates exceed the rates on which certification under this section was based, the Administrator shall notify the Board. Thereupon the Board shall give the supplier of such vehicles written notice of this finding, issue public notice of it, and give the supplier an opportunity to make necessary repairs, adjustment, or replacements. If no such repairs, adjustments, or replacements are made within a period to be set by the Board, the Board may order the supplier to show cause why the vehicle involved should be eligible for recertification.

(i) There are authorized to be appropriated for paying additional amounts for motor vehicles pursuant to, and for carrying out the provisions of, this section, $5,-

000,000 for the fiscal year ending June 30, 1971, and $25,000,000 for each of the two succeeding fiscal years.

(j) The Board shall promulgate the procedures required to implement this section within one hundred and eighty days after the date of enactment of the Clean Air Amendments of 1970.

FUEL ECONOMY IMPROVEMENT FROM NEW MOTOR VEHICLES

SEC. 213. (a)(1) The Administrator and the Secretary of Transportation shall conduct a joint study, and shall report to the Committee on Interstate and Foreign Commerce of the United States House of Representatives and the Committees on Public Works and Commerce of the United States Senate within one hundred and twenty days following the date of enactment of this section, concerning the practicability of establishing a fuel economy improvement standard of 20 per centum for new motor vehicles manufactured during and after model year 1980. Such study and report shall include, but not be limited to, the technological problems of meeting any such standard, including the leadtime involved; the test procedures required to determine compliance; the economic costs associated with such standard, including any beneficial economic impact; the various means of enforcing such standard; the effect on consumption of natural resources, including energy consumed; and the impact of applicable safety and emission standards. In the course of performing such study, the Administrator and the Secretary of Transportation shall utilize the research previously performed in the Department of Transportation, and the Administrator and the Secretary shall consult with the Federal Energy Administrator, the Chairman of the Council on Environmental Quality, and the Secretary of the Treasury. The Office of Management and Budget may review such report before its submission to such committees of the Congress, but such Office may not revise the report or delay its submission beyond the date prescribed for its submission, and may submit to Congress its comments respecting such report. In connection with such study, the Administrator may utilize the authority provided in section 307(a) of this Act to obtain necessary information.

(2) For the purpose of this section, the term "fuel economy improvement standard" means a requirement of a percentage increase in the number of miles of transportation provided by a manufacturer's entire annual production of new motor vehicles per unit of fuel consumed, as determined for each manufacturer in accordance with test procedures established by the Administrator pursuant to this Act. Such term shall not include any requirement for any design standard or any other requirement specifying or otherwise limiting the manufacturer's discretion in deciding how to comply with the fuel economy improvement standard by any lawful means.

STUDY OF PARTICULATE EMISSIONS FROM MOTOR VEHICLES

SEC. 214. (a)(1) The Administrator shall conduct a study concerning the effects on health and welfare of particulate emissions from motor vehicles or motor vehicle engines to which section 202 applies. Such study shall characterize and quantify such emissions and analyze the relationship of such emissions to various fuels and fuel additives.

(2) The study shall also include an analysis of particulate emissions from mobile sources which are not related to engine emissions (including, but not limited to tire debris, and asbestos from brake lining).

(b) The Administrator shall report to the Congress the findings and results of the study conducted under subsection (a) not later than two years after the date of the enactment of the Clean Air Act Amendments of 1977. Such report shall also include recommendations for standards or methods to regulate particulate emissions described in paragraph (2) of subsection (a).

HIGH ALTITUDE PERFORMANCE ADJUSTMENTS

SEC. 215. (a)(1) Any action taken with respect to any element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title (including any alteration or adjustment of such element), shall be treated as not in violation of section 203(a) if such action is performed in accordance with high altitude adjustment instructions provided by the manufacturer under subsection (b) and approved by the Administrator.

(2) If the Administrator finds that adjustments or modifications made pursuant to instructions of the manufacturer under paragraph (1) will not insure emission control performance with respect to each standard under section 202 at least equivalent to that which would result if no such adjustments or modifications were made, he shall disapprove such instructions. Such findings shall be based upon minimum engineering evaluations consistent with good engineering practice.

(b)(1) Instructions respecting each class or category of vehicles or engines to which this title applies providing for such vehicle and engine adjustments and modifications as may be necessary to insure emission control performance at different altitudes shall be submitted by the manufacturer to the Administrator pursuant to regulations promulgated by the Administrator.

(2) Any knowing violation by a manufacturer of requirements of the Administrator under paragraph (1) shall be treated as a violation by such manufacturer of section 203(a)(3) for purposes of the penalties contained in section 205.

(3) Such instruction shall provide, in addition to other adjustments, for adjustments for vehicles moving from high altitude areas to low altitude areas after the initial registration of such vehicles.

(c) No instructions under this section respecting adjustments or modifications may require the use of any manufacturer parts (as defined in section 203(a)) unless the manufacturer demonstrates to the satisfaction of the Administrator that the use of such manufacturer parts is necessary to insure emission control performance.

(d) Before January 1, 1981 the authority provided by this section shall be available in any high altitude State (as determined under regulations of the Administrator under regulations promulgated before the date of the enactment of this Act) but after December 31, 1980, such authority shall be available only in any such State in which an inspection and maintenance program for the testing of motor vehicle emissions has been instituted for the portions of the State where any national ambient air quality standard for auto-related pollutants has not been attained.

DEFINITIONS FOR PART A

SEC. 216. As used in this part—

(1) The term "manufacturer" as used in sections 202, 203, 206, 207, and 208 means any person engaged in the manufacturing or assembling of new motor vehicles or new motor vehicle engines, or importing such vehicles or engines for resale, or who acts for and is under the control of any such person in connection with the distribution of new motor vehicles or new motor vehicle engines, but shall not include any dealer with respect to new motor vehicles or new motor vehicle engines received by him in commerce.

(2) The term "motor vehicle" means any self-propelled vehicle designed for transporting persons or property on a street or highway.

(3) Except with respect to vehicles or engines imported or offered for importation, the term "new motor vehicle" means a motor vehicle the equitable or legal title to which has never been transferred to an ultimate purchaser; and the term "new motor vehicle engine" means an engine in a new motor vehicle or a motor vehicle engine the equitable or legal title to which has never been transferred to the ultimate purchaser; and with respect to imported vehicles or engines, such terms mean a motor vehicle and engine, respectively, manufactured after the effective date of

a regulation issued under section 202 which is applicable to such vehicle or engine (or which would be applicable to such vehicle or engine had it been manufactured for importation into the United States).

(4) The term "dealer" means any person who is engaged in the sale or the distribution of new motor vehicles or new motor vehicle engines to the ultimate purchaser.

(5) The term "ultimate purchaser" means, with respect to any new motor vehicle or new motor vehicle engine, the first person who in good faith purchases such new motor vehicle or new engine for purposes other than resale.

(6) The term "commerce" means (A) commence between any place in any State and any place outside thereof; and (B) commerce wholly within the District of Columbia.

PART B—AIRCRAFT EMISSION STANDARDS

ESTABLISHMENT OF STANDARDS

SEC. 231. (a)(1) Within 90 days after the date of enactment of the Clean Air Amendments of 1970, the Administrator shall commence a study and investigation of emissions of air pollutants from aircraft in order to determine—

(A) the extent to which such emissions affect air quality in air quality control regions throughout the United States, and

(B) the technological feasibility of controlling such emissions.

(2) The Administrator shall, from time to time, issue proposed emission standards applicable to the emission of any air pollutant from any class or classes of aircraft engines which in his judgment causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare.

(3) The administrator shall hold public hearings with respect to such proposed standards. Such hearings shall, to the extent practicable, be held in air quality control regions which are most seriously affected by aircraft emissions. Within 90 days after the issuance of such proposed regulations, he shall issue such regulation with such modifications as he deems appropriate. Such regulations may be revised from time to time.

(b) Any regulation prescribed under this section (and any revision thereof) shall take effect after such period as the Administrator finds necessary (after consultation with the Secretary of Transportation) to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.

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(c) Any regulations in effect under this section on date of enactment of the Clean Air Act Amendments of 1977 or proposed or promulgated thereafter, or amendments thereto, with respect to aircraft shall not apply if disapproved by the President, after notice and opportunity for public hearing, on the basis of a finding by the Secretary of Transportation that any such regulation would create a hazard to aircraft safety. Any such finding shall include a reasonably specific statement of the basis upon which the finding was made.

ENFORCEMENT OF STANDARDS

SEC. 232. (a) The Secretary of Transportation, after consultation with the Administrator, shall prescribe regulations to insure compliance with all standards prescribed under section 231 by the Administrator. The regulations of the Secretary of Transportation shall include provisions making such standards applicable in the issuance, amendment, modification, suspension, or revocation of any certificate authorized by the Federal Aviation Act or the Department of Transportation Act. Such Secretary shall insure that all necessary inspections are accomplished, and, may execute any power or duty vested in him by any other provision of law in the execution of all powers and duties vested in him under this section.

(b) In any action to amend, modify, suspend, or revoke a certificate in which violation of an emission standard prescribed under section 231 or of a regulation prescribed under subsection (a) is at issue, the certificate holder shall have the same notice and appeal rights as are prescribed for such holders in the Federal Aviation Act of 1958 or the Department of Transportation Act, except that in any appeal to the National Transportation Safety Board, the Board may amend, modify, or revoke the order of the Secretary of Transportation only if it finds no violation of such standard or regulation and that such amendment, modification, or revocation is consistent with safety in air transportation.

STATE STANDARDS AND CONTROLS

SEC. 233. No State or political subdivision thereof may adopt or attempt to enforce any standard respecting emissions of any air pollutant from any aircraft or engine thereof unless such standard is identical to a standard applicable to such aircraft under this part.

DEFINITIONS

SEC. 234. Terms used in this part (other than Administrator) shall have the same meaning as such terms have under section 101 of the Federal Aviation Act of 1958.

TITLE III—GENERAL

ADMINISTRATION

SEC. 301. (a)(1) The Administrator is authorized to prescribe such regulations as are necessary to carry out his functions under this Act. The Administrator may delegate to any officer or employee of the Environmental Protection Agency such of his powers and duties under this Act, except the making of regulations, as he may deem necessary or expedient.

(2) Not later than one year after the date of enactment of this paragraph, the Administrator shall promulgate regulations establishing general applicable procedures and policies for regional officers and employees (including the Regional Administrator) to follow in carrying out a delegation under paragraph (1), if any. Such regulations shall be designed—

(A) to assure fairness and uniformity in the criteria, procedures, and policies applied by the various regions in implementing and enforcing the Act;

(B) to assure at least an adequate quality audit of each State's performance and adherence to the requirements of this Act in implementing and enforcing the Act, particularly in the review of new sources and in enforcement of the Act; and

(C) to provide a mechanism for identifying and standardizing inconsistent or varying criteria, procedures, and policies being employed by such officers and employees in implementing and enforcing the Act.

(b) Upon the request of an air pollution control agency, personnel of the Environmental Protection Agency may be detailed to such agency for the purpose of carrying out the provisions of this Act.

(c) Payments under grants made under this Act may be made in installments, and in advance or by way of reimbursement, as may be determined by the Administrator.

DEFINITIONS

SEC. 302. When used in this Act—

(a) The term "Administrator" means the Administrator of the Environmental Protection Agency.

(b) The term "air pollution control agency" means any of the following:

(1) A single State agency designated by the Governor of that State as the official State air pollution control agency for purposes of this Act;

(2) An agency established by two or more States and having substantial powers or duties pertaining to the prevention and control of air pollution;

(3) A city, county, or other local government health authority, or, in the case of any city, county, or other local government in which there is an agency other than the health authority charged with responsibility for enforcing ordinances or laws relating to the prevention and control of air pollution, such other agency; or

(4) An agency of two or more municipalities located in the same State or in different States and having substantial powers or duties pertaining to the prevention and control of air pollution.

(c) The term "interstate air pollution control agency" means—

(1) an air pollution control agency established by two or more States, or

(2) an air pollution control agency of two or more municipalities located in different States.

(d) The term "State" means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, and American Samoa and includes the Commonwealth of the Northern Mariana Islands.

(e) The term "person" includes an individual, corporation, partnership, association, State, municipality, political subdivision of a State, and any agency, department, or instrumentality of the United States and any officer, agent, or employee thereof.

(f) The term "municipality" means a city, town, borough, county, parish, district, or other public body created by or pursuant to State law.

(g) The term "air pollutant" means any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air.

(h) All language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

(i) The term "Federal land manager" means, with respect to any lands in the United States, the Secretary of the department with authority over such lands.

(j) Except as otherwise expressly provided, the terms "major stationary source" and "major emitting facility" mean any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant (including any major emitting facility or source of fugitive emissions of any such pollutant, as determined by rule by the Administrator).

(k) The terms "emission limitation" and "emission standard" mean a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction.

(l) The term "standard of performance" means a requirement of continuous emission reduction, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction.

(m) The term "means of emission limitation" means a system of continuous emission reduction (including the use of specific technology or fuels with specified pollution characteristics).

(n) The term "primary standard attainment date" means the date specified in the applicable implementation plan for the attainment of a national primary ambient air quality standard for any air pollutant.

(o) The term "delayed compliance order" means an order issued by the State or by the Administrator to an existing stationary source, postponing the date required under an applicable implementation plan for compliance by such source with any requirement of such plan.

(p) The term "schedule and timetable of compliance" means a schedule of required measures including an enforceable sequence of actions or operations leading to compliance with an emission limitation, other limitation, prohibition, or standard.

EMERGENCY POWERS

SEC. 303. (a) Notwithstanding any other provisions of this Act, the Administrator upon receipt of evidence that a pollution source or combination of sources (including moving sources) is presenting an imminent and substantial endangerment to the health of persons, and that appropriate State or local authorities have not acted to abate such sources, may bring suit on behalf of the United States in the appropriate United States district court to immediately restrain any person causing or contributing to the alleged pollution to stop the emission of air pollutants causing or contributing to such pollution or to take such other action as may be necessary. If it is not practicable to assure prompt protection of the health of persons solely by commencement of such a civil action, the Administrator may issue such orders as may be necessary to protect the health of persons who are, or may be, affected by such pollution source (or sources). Prior to taking any action under this section, the Administrator shall consult with the State and local authorities in order to confirm the correctness of the in-

formation on which the action proposed to be taken is based and to ascertain the action which such authorities are, or will be, taking. Such order shall be effective for a period of not more than twenty-four hours unless the Administrator brings an action under the first sentence of this subsection before the expiration of such period. Whenever the Administrator brings such an action within such period, such order shall be effective for a period of forty-eight hours or such longer period as may be authorized by the court pending litigation or thereafter.

(b) Any person who willfully violates, or fails or refuses to comply with, any order issued by the Administrator under subsection (a) may, in an action brought in the appropriate United States district court to enforce such order, be fined not more than $5,000 for each day during which such violation occurs or failure to comply continues.

CITIZEN SUITS

SEC. 304. (a) Except as provided in subsection (b), any person may commence a civil action on his own behalf—

(1) against any person (including (i) the United States, and (ii) any other governmental instrumentality or agency to the extent permitted by the Eleventh Amendment to the Constitution) who is alleged to be in violation of (A) an emission standard or limitation under this Act or (B) an order issued by the Administrator or a State with respect to such a standard or limitation,

(2) against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this Act which is not discretionary with the Administrator, or

(3) against any person who proposes to construct or constructs any new or modified major emitting facility without a permit required under part C of title I (relating to significant deterioration of air quality) or part D of title I (relating to nonattainment) or who is alleged to be in violation of any condition of such permit.

The district courts shall have jurisdistion, without regard to the amount in controversy or the citizenship of the parties, to enforce such an emission standard or limitation, or such an order, or to order the Administrator to perform such act or duty, as the case may be.

(b) No action may be commenced—

(1) under subsection (a)(1)—

(A) prior to 60 days after the plaintiff has given notice of the violation (i) to the Administrator, (ii) to the State in which the violation occurs, and (iii) to any alleged violator of the standard, limitation, or order, or

(B) if the Administrator or State has commenced and is diligently prosecuting a civil action in a court of the United States or a State to require compliance with the standard, limitation, or order, but in any such action in a court of the United States any person may intervene as a matter of right.

(2) under subsection (a)(2) prior to 60 days after the plaintiff has given notice of such action to the Administrator,

except that such action may be brought immediately after such notification in the case of an action under this section respecting a violation of section 112(c)(1)(B) or an order issued by the Administrator pursuant to section 113(a). Notice under this subsection shall be given in such manner as the Administrator shall prescribe by regulation.

(c)(1) Any action respecting a violation by a stationary source of an emission standard or limitation or an order respecting such standard or limitation may be brought only in the judicial district in which such source is located.

(2) In such action under this section, the Administrator, if not a party, may intervene as a matter of right.

(d) The court, in issuing any final order in any action brought pursuant to subsection (a) of this section, may award costs of litigation (including reasonable attorney and expert witness fees) to any party, whenever the court determines such award is appropriate. The court may, if a temporary restraining order or preliminary injunction is sought, require the filing of a bond or equivalent security in accordance with the Federal Rules of Civil Procedure.

(e) Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any emission standard or limitation or to seek any other relief (including relief against the Administrator or a State agency). Nothing in this section or in any other law of the United States shall be construed to prohibit, exclude, or restrict any State, local, or interstate authority from—

(1) bringing any enforcement action or obtaining any judicial remedy or sanction in any State or or local court, or

(2) bringing any administrative enforcement action or obtaining any administrative remedy or sanction in any State or local administrative agency, department or instrumentality,

against the United States, any department, agency, or instrumentality thereof, or any officer, agent, or employee thereof under State or local law respecting control and abatement of air pollution. For provisions requiring com-

pliance by the United States, departments, agencies, instrumentalities, officers, agents, and employees in the same manner as nongovernmental entities, see section 118.

(f) For purposes of this section, the term "emission standard or limitation under this Act" means—

(1) a schedule or timetable of compliance, emission limitation, standard of performance or emission standard,

(2) a control or prohibition respecting a motor vehicle fuel or fuel additive, which is in effect under this Act (including a requirement applicable by reason of section 118) or under an applicable implementation plan, or

(3) any condition or requirement of a permit under part C of title I (relating to significant deterioration of air quality) or part D of title I (relating to nonattainment), any condition or requirement of section 113(d) (relating to certain enforcement orders), section 119 (relating to primary nonferrous smelter orders), any condition or requirement under an applicable implementation plan relating to transportation control measures, air quality maintenance plans, vehicle inspection and maintenance programs or vapor recovery requirements, section 211 (e) and (f) (relating to fuels and fuel additives), section 169A (relating to visibility protection), any condition or requirement under part B of title I (relating to ozone protection), or any requirement under section 111 or 112 (without regard to whether such requirement is expressed as an emission standard or otherwise).

REPRESENTATION IN LITIGATION

SEC. 305. (a) The Administrator shall request the Attorney General to appear and represent him in any civil action instituted under this Act to which the Administrator is a party. Unless the Attorney General notifies the Administrator that he will appear in such action, within a reasonable time, attorneys appointed by the Administrator shall appear and represent him.

(b) In the event the Attorney General agrees to appear and represent the Administrator in any such action, such representation shall be conducted in accordance with, and shall include participation by, attorneys appointed by the Administrator to the extent authorized by, the memorandum of understanding between the Department of Justice and the Environmental Protection Agency, dated June 13, 1977, respecting representation of the agency by the department in civil litigation.

FEDERAL PROCUREMENT

SEC. 306. (a) No Federal agency may enter into any contract with any person who is convicted of any offense under section 113(c)(1) for the procurement of goods, materials, and services to perform such contract at any facility at which the violation which gave rise to such conviction occurred if such facility is owned, leased, or supervised by such person. The prohibition in the preceding sentence shall continue until the Administrator certifies that the condition giving rise to such a conviction has been corrected.

(b) The Administrator shall establish procedures to provide all Federal agencies with the notification necessary for the purposes of subsection (a).

(c) In order to implement the purposes and policy of this Act to protect and enhance the quality of the Nation's air, the President shall, not more than 180 days after enactment of the Clean Air Amendments of 1970 cause to be issued an order (1) requiring each Federal agency authorized to enter into contracts and each Federal agency which is empowered to extend Federal assistance by way of grant, loan, or contract to effectuate the purpose and policy of this Act in such contracting or assistance activities, and (2) setting forth procedures, sanctions, penalties, and such other provisions, as the President determines necessary to carry out such requirement.

(d) The President may exempt any contract, loan, or grant from all or part of the provisions of this section where he determines such exemption is necessary in the paramount interest of the United States and he shall notify the Congress of such exemption.

(e) The President shall annually report to the Congress on measures taken toward implementing the purpose and intent of this section, including but not limited to the progress and problems associated with implementation of this section.

GENERAL PROVISIONS RELATING TO ADMINISTRATIVE PROCEEDINGS AND JUDICIAL REVIEW

SEC. 307. (a)(1) In connection with any determination under section 110(f) or section 202(b)(5), or for purposes of obtaining information under section 202(b)(4) or 211(c)(3), the Administrator may issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and he may administer oaths. Except for emission data, upon a showing satisfactory to the Administrator by such owner or operator that such papers, books, documents, or information or particular part thereof, if made public, would divulge trade secrets or secret processes of such

owner or operator, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the purposes of section 1905 of title 18 of the United States Code, except that such paper, book, document, or information may be discussed to other officers, employees, or authorized representatives of the United States concerned with carrying out this Act, to persons carrying out the National Academy of Sciences' study and investigation provided for in section 202(c), or when relevant in any proceeding under this Act. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In cases of contumacy or refusal to obey a subpena served upon any person under this subparagraph, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Administrator to appear and produce papers, books, and documents before the Administrator, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(b)(1) A petition for review of action of the Administrator in promulgating any national primary or secondary ambient air quality standard, any emission standard or requirement under section 112, any standard of performance or requirement under section 111,[7] any standard under section 202 (other than a standard required to be prescribed under section 202(b)(1)), any determination under section 202(b)(5), any control or prohibition under section 211, any standard under section 231, any rule issued under section 113, 119, or under section 120, or any other nationally applicable regulations promulgated, or final action taken, by the Administrator under this Act may be filed only in the United States Court of Appeals for the District of Columbia. A petition for review of the Administrator's action in approving or promulgating any implementation plan under section 110 or section 111(d), any order under section 111(j), under section 112(c), under section 113(d), under section 119, or under section 120, or his action under section 119(c)(2)(A), (B), or (C) (as in effect before the date of enactment of the Clean Air Act Amendments of 1977) or under regulations thereunder, or any other final action of the Administrator under this Act (including any denial or disapproval by the Administrator under title I) which is local or regionally applicable may be filed only in the United States Court of Appeals for the appropriate circuit. Notwithstanding the preceding sentence a petition for review of any action referred to in such sentence may be filed only in the United States Court of Appeals for the District of Columbia if such action is based on a determination of nationwide scope or effect and if in taking such action the Administrator finds and publishes that such action is based on such a determination. Any petition for review under this subsection shall be filed within sixty days from the date notice of such promulgation, approval, or action appears in the Federal Register, except that if such petition is based solely on grounds arising after such sixtieth day, then any petition for review under this subsection shall be filed within sixty days after such grounds arise.

[7] Public Law 95-95 inserted the additional "," after the words "under section 111".

(2) Action of the Administrator with respect to which review could have been obtained under paragraph (1) shall not be subject to judicial review in civil or criminal proceedings for enforcement.

(c) In any judicial proceeding in which review is sought of a determination under this Act required to be made on the record after notice and opportunity for hearing, if any party applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the proceeding before the Administrator, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Administrator, in such manner and upon such terms and conditions as the court may deem proper. The Administrator may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

(d)(1) This subsection applies to—

(A) the promulgation or revision of any national ambient air quality standard under section 109,

(B) the promulgation or revision of an implementation plan by the Administrator under section 110(c),

(C) the promulgation or revision of any standard of performance under section 111 or emission standard under section 112,

(D) the promulgation or revision of any regulation pertaining to any fuel or fuel additive under section 211,

(E) the promulgation or revision of any aircraft emission standard under section 231,

(F) promulgation or revision of regulations pertaining to orders for coal conversion under section 113(d)(5) (but not including orders granting or denying any such orders),

(G) promulgation or revision of regulations pertaining to primary nonferrous smelter orders under section 119 (but not including the granting or denying of any such order),

(H) promulgation or revision of regulations under subtitle B of title I (relating to stratosphere and ozone protection),

(I) promulgation or revision of regulations under subtitle C of title I (relating to prevention of significant deterioration of air quality and protection of visibility),

(J) promulgation or revision of regulations under section 202 and test procedures for new motor vehicles or engines under sectoin 206, and the revision of a standard under section 202(a)(3),

(K) promulgation or revision of regulations for noncompliance penalties under section 120,

(L) promulgation or revision of any regulations promulgated under section 207 (relating to warranties and compliance by vehicles in actual use),

(M) action of the Administrator under section 126 (relating to interstate pollution abatement), and

"(N) such other actions as the Administrator may determine. The provisions of section 553 through 557 and section 706 of title 5 of the United States Code shall not, except as expressly provided in this subsection, apply to action to which this subsection applies. This subsection shall not apply in the case of any rule or circumstance referred to in subparagraphs (A) or (B) of subsection 553(b) of title 5 of the United States Code.

(2) Not later than the date of proposal of any action to which this subsection applies, the Administrator shall establish a rulemaking docket for such action (hereinafter in this subsection referred to as a "rule"). Whenever a rule applies only within a particular State, a second (identical) docket shall be established in the appropriate regional office of the Environmental Protection Agency.

(3) In the case of any rule to which this subsection applies, notice of proposed rulemaking shall be published in the Federal Register, as provided under section 553(b) of title 5, United States Code, shall be accompanied by a statement of its basis and purpose and shall specify the period available for public comment (hereinafter referred to as the "comment period"). The notice of proposed rulemaking shall also state the docket number, the location or locations of the docket, and the times it will be open to public inspection. The statement of basis and purpose shall include a summary of—

(A) the factual data on which the proposed rule is based;

(B) the methodology used in obtaining the data and in analyzing the data; and

(C) the major legal interpretations and policy considerations underlying the proposed rule.

The statement shall also set forth or summarize and provide a reference to any pertinent findings, recommendations, and comments by the Scientific Review Committee established under section 109(d) and the National Academy of Sciences, and, if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences. All data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule.

(4) (A) The rulemaking docket required under paragraph (2) shall be open for inspection by the public at reasonable times specified in the notice of proposed rulemaking. Any person may copy documents contained in the docket. The Administrator shall provide copying facilities which may be used at the expense of the person seeking copies, but the Administrator may waive or reduce such expenses in such instances as the public interest requires. Any person may request copies by mail if the person pays the expenses, including personnel costs to do the copying.

(B)(i) Promptly upon receipt by the agency, all written comments and documentary information on the proposed rule received from any person for inclusion in the docket during the comment period shall be placed in the docket. The transcript of public hearings, if any, on the proposed rule shall also be included in the docket promptly upon receipt from the person who transcribed such hearings. All documents which become available after the proposed rule has been published and which the Administrator determines are of central relevance to the rulemaking shall be placed in the docket as soon as possible after their availability.

(ii) The drafts of proposed rules submitted by the Administrator to the Office of Management and Budget for any interagency review process prior to proposal of any such rule, all documents accompanying such drafts, and all written comments thereon by other agencies and all written responses to such written comments by the Administrator shall be placed in the docket no later than the date of proposal of the rule. The drafts of the final rule submitted for such review process prior to promulgation and all such written comments thereon, all documents accompanying such drafts, and written responses thereto shall be placed in the docket no later than the date of promulgation.

(5) In promulgating a rule to which this subsection applies (i) the Administrator shall allow any person to submit written comments, data, or documentary information; (ii) the Administrator shall give interested persons an opportunity for the oral presentation of data, views, or arguments, in addition to an opportunity to make written submissions; (iii) a transcript shall be kept of any oral presentation; and (iv) the Administrator shall keep the record of such proceeding open for thirty days after completion of the proceeding to provide an opportunity for submission of rubuttal and supplementary information.

(6)(A) The promulgated rule shall be accompanied by (i) a statement of basis and purpose like that referred to in paragraph (3) with respect to a proposed rule and (ii) an explanation of the reasons for any major changes in the promulgated rule from the proposed rule.

(B) The promulgated rule shall also be accompanied by a response to each of the significant comments, criticisms, and new data submitted in written or oral presentations during the comment period.

(C) The promulgated rule may not be based (in part or whole) on any information or data which has not been placed in the docket as of the date of such promulgation.

(7)(A) The record for judicial review shall consist exclusively of the material referred to in paragraph (3), clause (i) of paragraph (4)(B), and subparagraphs (A) and (B) of paragraph (6).

(B) Only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review. If the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within such time or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed. If the Administrator refuses to convene such a proceeding, such person may seek review of such refusal in the United States court of appeals for the appropriate circuit (as provided in subsection (b)). Such reconsideration shall not postpone the effectiveness of the rule. The effectiveness of the rule may be stayed during such reconsideration, however, by the Administrator or the court for a period not to exceed three months.

(8) The sole forum for challenging procedural determinations made by the Administrator under this subsection shall be in the United States court of appeals for

the appropriate circuit (as provided in subsection (b)) at the time of the substantive review of the rule. No interlocutory appeals shall be permitted with respect to such procedural determinations. In reviewing alleged procedural errors, the court may invalidate the rule only if the errors were so serious and related to matters of such central relevance to the rule that there is a substantial likelihood that the rule would have been significantly changed if such errors had not been made.

(9) In the case of review of any action of the Administrator to which this subsection applies, the court may reverse any such action found to be—

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

(B) contrary to constitutional right, power, privilege, or immunity;

(C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right; or

(D) without observance of procedure required by law, if (i) such failure to observe such procedure is arbitrary or capricious, (ii) the requirement of paragraph (7)(B) has been met, and (iii) the condition of the last sentence of paragraph (8) is met.

(10) Each statutory deadline for promulgation of rules to which this subsection applies which requires promulgation less than six months after date of proposal may be extended to not more than six months after date of proposal by the Administrator upon a determination that such extension is necessary to afford the public, and the agency, adequate opportunity to carry out the purposes of this subsection.

(11) The requirements of this subsection shall take effect with respect to any rule the proposal of which occurs after ninety days after the date of enactment of the Clean Air Act Amendments of 1977.

(e) Nothing in this Act shall be construed to authorize judicial review of regulations or orders of the Administrator under this Act, except as provided in this section.

(f) In any judicial proceeding under this section, the court may award costs of litigation (including reasonable attorney and expert witness fees) whenever it determines that such award is appropriate.

(g) In any action respecting the promulgation of regulations under section 120 or the administration or enforcement of section 120 no court shall grant any stay, injunctive, or similar relief before final judgment by such court in such action.

MANDATORY LICENSING

SEC. 308. Whenever the Attorney General determines upon application of the Administrator—

(1) that—

(A) in the implementation of the requirements of section 111, 112, or 202 of this Act, a right under any United States letters patent, which is being used or intended for public or commercial use and not otherwise reasonably available, is necessary to enable any person required to comply with such limitation to so comply, and

(B) there are no reasonable alternative methods to accomplish such purpose, and

(2) that the unavailability of such right may result in a substantial lessening of competition or tendency to create a monopoly in any line of commerce in any section of the country,

the Attorney General may so certify to a district court of the United States, which may issue an order requiring the person who owns such patent to license it on such reasonable terms and conditions as the court, after hearing, may determine. Such certification may be made to the district court for the district in which the person owning the patent resides, does business, or is found.

POLICY REVIEW

SEC. 309. (a) The Administrator shall review and comment in writing on the environmental impact of any matter relating to duties and responsibilities granted pursuant to this Act or other provisions of the authority of the Administrator, contained in any (1) legislation proposed by any Federal department or agency, (2) newly authorized Federal projects for construction and any major Federal agency action (other than a project for construction) to which section 102(2)(C) of Public Law 91-190 applies, and (3) proposed regulations published by any department or agency of the Federal Government. Such written comment shall be made public at the conclusion of any such review.

(b) In the event the Administrator determines that any such legislation, action, or regulation is unsatisfactory from the standpoint of public health or welfare or environmental quality, he shall publish his determination and the matter shall be referred to the Council on Environmental Quality.

OTHER AUTHORITY NOT AFFECTED

SEC. 310. (a) Except as provided in subsection (b) of this section, this Act shall not be construed as superseding or limiting the authorities and responsibilities, under any other provision of law, of the Administrator or any other Federal officer, department, or agency.

(b) No appropriation shall be authorized or made under section 301, 311, or 314 of the Public Health Service Act for any fiscal year after the fiscal year ending

June 30, 1964, for any purpose for which appropriations may be made under authority of this Act.

RECORDS AND AUDIT

SEC. 311. (a) Each recipient of assistance under this Act shall keep such records as the Administrator shall prescribe, including records which fully disclose the amount and disposition by such recipient of the proceeds of such assistance, the total cost of the project or undertaking in connection with which such assistance is given or used, and the amount of that portion of the cost of the project or undertaking supplied by other sources, and such other records as will facilitate an effective audit.

(b) The Administrator and the Comptroller General of the United States, or any of their duly authorized representatives, shall have access for the purpose of audit and examinations to any books, documents, papers, and records of the recipients that are pertinent to the grants received under this Act.

COMPREHENSIVE ECONOMIC COST STUDIES AND STUDIES OF COST-EFFECTIVENESS ANALYSIS

SEC. 312. (a) In order to provide the basis for evaluating programs authorized by this act and the development of new programs and to furnish the Congress with the information necessary for authorization of appropriations by fiscal years beginning after June 30, 1969, the Administrator, in cooperation with State, interstate, and local air pollution control agencies, shall make a detailed estimate of the cost of carrying out the provisions of this Act; a comprehensive study of the cost of program implementation by affected units of government; and a comprehensive study of the economic impact of air quality standards on the Nation's industries, communities, and other contributing sources of pollution, including an analysis of the national requirements for and the cost of controlling emissions to attain such standards of air quality as may be established pursuant to this Act or applicable State law. The Administrator shall submit such detailed estimate and the results of such comprehensive study of cost for the five-year period beginning July 1, 1969, and the results of such other studies, to the Congress not later than January 10, 1969, and shall submit a reevaluation of such estimate and studies annually thereafter.

(b) The Administrator shall also make a complete investigation and study to determine (1) the need for additional trained State and local personnel to carry out programs assisted pursuant to this Act and other programs for the same purpose as this Act; (2) means of using existing Federal training programs to train such

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personnel; and (3) the need for additional trained personnel to develop, operate and maintain those pollution control facilities designed and installed to implement air quality standards. He shall report the results of such investigation and study to the President and the Congress not later than July 1, 1969.

(c) Not later than January 1, 1979, the Administrator shall study the possibility of increased use of cost-effectiveness analyses in devising strategies for the control of air pollution and shall report its recommendations to the Congress, including any recommendations for revisions in any provision of this Act. Such study shall also include an analysis and report to Congress concerning whether or not existing air pollution control strategies are adequate to achieve the purposes of this Act.

ADDITIONAL REPORTS TO CONGRESS

SEC. 313. Not later than six months after the effective date of this section and not later than January 10 of each calendar year beginning after such date, the Administrator shall report to the Congress on measures taken toward implementing the purpose and intent of this Act including, but not limited to, (1) the progress and problems associated with control of automotive exhaust emissions and the research efforts related thereto; (2) the development of air quality criteria and recommended emission control requirements; (3) the status of enforcement actions taken pursuant to this Act; (4) the status of State ambient air standards setting, including such plans for implementation and enforcement as have been developed; (5) the extent of development and expansion of air pollution monitoring systems: (6) progress and problems related to development of new and improved control techniques; (7) the development of quantitative and qualitative instrumentation to monitor emissions and air quality; (8) standards set or under consideration pursuant to title II of this Act; (9) the status of State, interstate, and local pollution control programs established pursuant to and assisted by this Act; (10) the reports and recommendations made by the President's Air Quality Advisory Board; and (11) (A) the status of plan provisions developed by States as required under section 110(a)(2)(F)(v), and an accounting of States failing to develop suitable plans; (B) the number of annual incidents of air pollution reaching or exceeding levels determined to present an imminent and substantial endangerment to health (within the meaning of section 303) by location, date, pollution source, and the duration of the emergency; (C) measures taken pursuant to section 110(a)(2)(F)(v), and an evaluation of their effectiveness in reducing pollution; and (D) an accounting of those instances in which an air pollution alert, warning, or emergency is declared as required under regulations of the Administrator and in which no action is taken by either the Administrator, State, or local officials, together with an explanation for the failure to take action.

LABOR STANDARDS

SEC. 314. The Administrator shall take such action as may be necessary to insure that all laborers and mechanics employed by contractors or subcontractors on projects assisted under this Act shall be paid wages at rates not less than those prevailing for the same type of work on similar construction in the locality as determined by the Secretary of Labor, in accordance with the Act of March 3, 1931, as amended, known as the Davis-Bacon Act (46 Stat. 1494; 40 U.S.C. 276a-276a-5). The Secretary of Labor shall have, with respect to the labor standards specified in this subsection, the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 F.R. 3176; 64 Stat. 1267) and section 2 of the Act of June 13, 1934, as amended (48 Stat. 948; 40 U.S.C. 276c).

SEPARABILITY

SEC. 315. If any provision of this Act, or the application of any provision of this Act to any person or circumstance, is held invalid, the application of such provision to other persons or circumstances, and the remainder of this Act, shall not be affected thereby.

SEWAGE TREATMENT GRANTS

SEC. 316. (a) No grant which the Administrator is authorized to make to any applicant for construction of sewage treatment works in any area in any State may be withheld, conditioned, or restricted by the Administrator on the basis of any requirement of this Act except as provided in subsection (b).

(b) The Administrator may withhold, condition, or restrict the making of any grant for construction referred to in subsection (a) only if he determines that—

(1) such treatment works will not comply with applicable standards under section 111 or 112,

(2) the State does not have in effect, or is not carrying out, a State implementation plan approved by the Administrator which expressly quantifies and provides for the increase in emissions of each air pollutant (from stationary and mobile sources in any area to which either part C or part D of title I applies for such pollutant) which increase may reasonably be anticipated to result directly or indirectly from the new sewage treatment capacity which would be created by such construction.

(3) the construction of such treatment works would create new sewage treatment capacity which—

(A) may reasonably be anticipated to cause or contribute to, directly or indirectly, an increase in emissions of any air pollutant in excess of the increase provided for under the provisions referred to in paragraph (2) for any such area, or

(B) would otherwise not be in conformity with the applicable implementation plan, or

(4) such increase in emissions would interfere with, or be inconsistent with, the applicable implementation plan for any other State.

In the case of construction of a treatment works which would result, directly or indirectly, in an increase in emissions of any air pollutant from stationary and mobile sources in an area to which part D of title I applies, the quantification of emissions referred to in paragraph (2) shall include the emissions of any such pollutant resulting directly or indirectly from areawide and nonmajor stationary source growth (mobile and stationary) for each such area.

(c) Nothing in this section shall be construed to amend or alter any provision of the National Environmental Policy Act or to affect any determination as to whether or not the requirements of such Act have been met in the case of the construction of any sewage treatment works.

ECONOMIC IMPACT ASSESSMENT

SEC. 317. (a) This section applies to action of the Administrator is promulgating or revising—

(1) any new source standard of performance under section 111(b),

(2) any regulation under section 111(d),

(3) any regulation under part B of title I (relating to ozone and stratosphere protection),

(4) any regulation under part C of title I (relating to prevention of significant deterioration of air quality),

(5) any regulation establishing emission standards under section 202 and any other regulation promulgated under that section,

(6) any regulation controlling or prohibiting any fuel or fuel additive under section 211(c), and

(7) any aircraft emission standard under section 231.

Nothing in this section shall apply to any standard or regulation described in paragraphs (1) through (7) of this subseciton unless the notice of proposed rulemaking in connection with such standard or regulation is published in the Federal Register after the date ninety days after the date of enactment of this section. In the case of

revisions of such standards or regulations, this section shall apply only to revisions which the Administrator determines to be substantial revisions.

(b) Before publication of notice of proposed rulemaking with respect to any standard or regulation to which this section applies, the Administrator shall prepare an economic impact assessment respecting such standard or regulation. Such assessment shall be included in the docket required under section 307(d)(2) and shall be available to the public as provided in section 307(d)(4). Notice of proposed rulemaking shall include notice of such availability together with an explanation of the extent and manner in which the Administrator has considered the analysis contained in such economic impact assessment in proposing the action. The Administrator shall also provide such an explanation in his notice of promulgation of any regulation or standard referred to in subsection (a). Each such explanation shall be part of the statements of basis and purpose required under sections 307(d)(3) and 307(d)(6).

(c) Subject to subsection (d), the assessment required under this section with respect to any standard or regulation shall contain an analysis of—

(1) the costs of compliance with any such standard or regulation, including extent to which the costs of compliance will vary depending on (A) the effective date of the standard or regulation, and (B) the development of less expensive, more efficient means or methods of compliance with the standard or regulation;

(2) the potential inflationary or recessionary effects of the standard or regulation;

(3) the effects on competition of the standard or regulation with respect to small business;

(4) the effects of the standard or regulation on consumer costs; and

(5) the effects of the standard or regulation on energy use.

Nothing in this section shall be construed to provide that the analysis of the factors specified in this subsection affects or alters the factors which the Administrator is required to consider in taking any action referred to in subsection (a).

(d) The assessment required under this section shall be as extensive as practicable, in the judgment of the Administrator taking into account the time and resources available to the Environmental Protection Agency and other duties and authorities which the Administrator is required to carry out under this Act.

(e) Nothing in this section shall be construed—

(1) to alter the basis on which a standard or regulation is promulgated under this Act;

(2) to preclude the Administrator from carrying out his responsibility under this Act to protect public health and welfare; or

(3) to authorize or require any judicial review of any such standard or regulation, or any stay or injunction of the proposal, promulgation, or effectiveness of such standard or regulation on the basis of failure to comply with this section.

(f) The requirements imposed on the Administrator under this section shall be treated as nondiscretionary duties for purposes of section 304(a)(2), relating to citizen suits. The sole method for enforcement of the Administrator's duty under this section shall be by bringing a citizen suit under such section 304(a)(2) for a court order to compel the Administrator to perform such duty. Violation of any such order shall subject the Administrator to penalties for contempt of court.

(g) In the case of any provision of this Act in which costs are expressly required to be taken into account, the adequacy or inadequacy of any assessment required under this section may be taken into consideration, but shall not be treated for purposes of judicial review of any such provision as conclusive with respect to compliance or noncompliance with the requirement of such provision to take cost into account.

FINANCIAL DISCLOSURE; CONFLICTS OF INTEREST

SEC. 318. (a) Each person who—

(1) has any known financial interest in (A) any person subject to this Act, or (B) any person who applies for or receives any grant, contract, or other form of financial assistance pursuant to this Act, and

(2) is (A) an officer or employee of the Environmental Protection Agency who performs any function of duty under this Act, (B) a member of the National Commission on Air Quality appointed as a member of the public, or (C) a member of the scientific review committee under section 109(d)

shall, beginning six months after the date of enactment of this section, annually file with the Administrator, a written statement concerning all such interests held by such officer, employee, or member during the preceding calendar year. Such statement shall be available to the public.

(b) The Administrator shall—

(1) act within ninety days after the date of enactment of the Clean Air Act Amendments of 1977—

(A) to define the term "known financial interest" for purposes of subsection (a) of this section;

(B) to establish the methods by which the requirement to file written statements specified

in subsection (a) of this section will be monitored and enforced, including appropriate provisions for the filing by such officers, employees and members of such statements and the review by the Administrator (or the Commission in the case of members of the Commission) of such statements; and

(2) report to the Congress on June 1 of each calendar year with respect to such statements to the Administrator and the actions taken in regard thereto during the preceding calendar year.

(c) After the date one year after the date of the enactment of this section, no person who—

(1) is employed by, serves as attorney for, acts as a consultant for, or holds any other official or contractual relationship to—

(A) the owner or operator of any major stationary source or any stationary source which is subject to a standard of performance or emission standard under section 111 or 112,

(B) any manufacturer of any class or category of mobile sources if such mobile sources are subject to regulation under this Act,

(C) any trade or business association of which such owner or operator referred to in subparagraph (A) or such manufacturer referred to in subparagraph (B) is a member or

(D) any organization (whether or not nonprofit) which is a party to litigation, or engaged in political, educational, or informational activities, relating to air quality, or

(2) owns, or has any financial interest in, any stock, bonds, or other financial interest which ownership or interest may be inconsistent with a position as an officer or employee of the Environmental Protection Agency, as determined under regulations of the Administrator,

may concurrently serve as such an officer or employee of the Environmental Protection Agency.

(d) The Administrator shall promulgate rules for purposes of subsections (b) and (c) which—

(1) identify specific offices or positions within such agency which are of a nonregulatory or nonpolicymaking nature and provide that officers or employees occupying such positions shall be exempt from the requirements of this section, and

(2) identify the ownership or financial interests which may be inconsistent with particular regulatory or policymaking offices or positions within the Environmental Protection Agency.

(e) Any officer or employee of the Environmental Protection Agency or member of the National Commission on Air Quality or of the scientific review committee un-

der section 109(d) who is subject to, and knowingly violates, this section or any regulation issued thereunder, shall be fined not more than $2,500 or imprisoned not more than one year, or both.

(f) Nothing in this section shall be construed to affect or impair any other Federal statutory requirements respecting disclosure or conflict of interest applicable to the Environmental Protection Agency. Subsections (c) and (d) of this section shall not apply after the effective date of any such requirements respecting conflicts of interest which are generally applicable to departments, agencies, and instrumentalities of the United States.

AIR QUALITY MONITORING

SEC. 319. Not later than one year after the date of enactment of the Clean Air Act Amendments of 1977 and after notice and opportunity for public hearing, the Administrator shall promulgate regulations establishing an air quality monitoring system throughout the United States which—

(1) utilizes uniform air quality monitoring criteria and methodology and measures such air quality according to a uniform air quality index,

(2) provides for air quality monitoring stations in major urban areas and other appropriate areas throughout the United States to provide monitoring such as will supplement (but not duplicate) air quality monitoring carried out by the States required under any applicable implementation plan,

(3) provides for daily analysis and reporting of air quality based upon such uniform air quality index, and

(4) provides for recordkeeping with respect to such monitoring data and for periodic analysis and reporting to the general public by the Administrator with respect to air quality based upon such data.

The operation of such air quality monitoring system may be carried out by the Administrator or by such other departments, agencies, or entities of the Federal Government (including the National Weather Service) as the President may deem appropriate. Any air quality monitoring system required under any applicable implementation plan under section 110 shall, as soon as practicable following promulgation of regulations under this section, utilize the standard criteria and methodology, and measure air quality according to the standard index, established under such regulations.

STANDARDIZED AIR QUALITY MODELING

SEC. 320. (a) Not later than six months after the date of the enactment of the Clean Air Act Amendments of

1977, and at least every three years thereafter, the Administrator shall conduct a conference on air quality modeling. In conducting such conference, special attention shall be given to appropriate modeling necessary for carrying out part C of title I (relating to prevention of significant deterioration of air quality).

(b) The conference conducted under this section shall provide for participation by the National Academy of Sciences, representatives of State and local air pollution control agencies, and appropriate Federal agencies, including the National Science Foundation; the National Oceanic and Atmospheric Administration, and the National Bureau of Standards.

(c) Interested persons shall be permitted to submit written comments and a verbatim transcript of the conference proceedings shall be maintained.

(d) The comments submitted and the transcript maintained pursuant to subsection (c) shall be included in the docket required to be established for purposes of promulgating or revising any regulation relating to air quality modeling under part C of title I.

EMPLOYMENT EFFECTS

SEC. 321. (a) The Administrator shall conduct continuing evaluations of potential loss or shifts of employment which may result from the administration or enforcement of the provision of this Act and applicable implementation plans, including where appropriate, investigating threatened plant closures or reductions in employment allegedly resulting from such administration or enforcement.

(b) Any employee, or any representative of such employee, who is discharged or laid off, threatened with discharge or layoff, or whose employment is otherwise adversely affected or threatened to be adversely affected because of the alleged results of any requirement imposed or proposed to be imposed under this Act, including any requirement applicable to Federal facilities and any requirement imposed by a State or political subdivision thereof, may request the Administrator to conduct a full investigation of the matter. Any such request shall be reduced to writing, shall set forth with reasonable particularity the grounds for the request, and shall be signed by the employee, or representative of such employee, making the request. The Administrator shall thereupon investigate the matter and, at the request of any party, shall hold public hearings on not less than five days' notice. At such hearings, the Administrator shall require the parties, including the employer involved, to present information relating to the actual or potential effect of such requirements on employment and the detailed reasons or justification therefor. If the Ad-

ministrator determines that there are no reasonable grounds for conducting a public hearing he shall notify (in writing) the party requesting such hearing of such a determination and the reasons therefor. If the Administrator does convene such a hearing, the hearing shall be on the record. Upon receiving the report of such investigation, the Administrator shall make findings of fact as to the effect of such requirements on employment and on the alleged actual or potential discharge, layoff, or other adverse effect on employment, and shall make such recommendations as he deems appropriate. Such report, findings, and recommendations shall be available to the public.

(c) In connection with any investigation or public hearing conducted under subsection (b) of this section or as authorized in section 119 (relating to primary nonferrous smelter orders), the Administrator may issue subpenas for the attendance and testimony of witnesses and the production of revelant papers, books and documents, and he may administer oaths. Except for emission data, upon a showing satisfactory to the Administrator by such owner or operator that such papers, books, documents, or information or particular part thereof, if made public, would divulge trade secrets or secret processes of such owner, or operator, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the purposes of section 1905 of title 18 of the United States Code, except that such paper, book, document, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this Act, or when relevant in any proceeding under this Act. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In cases of contumacy or refusal to obey a subpena served upon any person under this subparagraph, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Administrator, to appear and produce papers, books, and documents before the Administrator, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(d) Nothing in this section shall be construed to require or authorize the Administrator, the States, or political subdivisions thereof, to modify or withdraw any requirement imposed or proposed to be imposed under this Act.

EMPLOYEE PROTECTION

SEC. 322. (a) No employer may discharge any employee or otherwise discriminate against any employee

with respect to his compensation, terms, conditions, or privileges of employment because the employee (or any person acting pursuant to a request of the employee)—

(1) commenced, caused to be commenced, or is about to commence or cause to be commenced a proceeding under this Act or a proceeding for the administration or enforcement of any requirement imposed under this Act or under any applicable implementation plan.

(2) testified or is about to testify in any such proceeding, or

(3) assisted or participated or is about to assist or participate in any manner in such a proceeding or in any other action to carry out the purposes of this Act.

(b) (1) Any employee who believes that he has been discharged or otherwise discriminated against by any person in violation of subsection (a) may, within thirty days after such violation occurs, file (or have any person file on his behalf) a complaint with the Secretary of Labor (hereinafter in this subsection referred to as the 'Secretary") alleging such discharge or discrimination. Upon receipt of such a complaint, the Secretary shall notify the person named in the complaint of the filing of the complaint.

(2) (A) Upon receipt of a complaint filed under paragraph (1), the Secretary shall conduct an investigation of the violation alleged in the complaint. Within thirty days of the receipt of such complaint, the Secretary shall complete such investigation and shall notify in writing the complainant (and any person acting in his behalf) and the person alleged to have committed such violation of the results of the investigation conducted pursuant to this subparagraph. Within ninety days of the receipt of such complaint the Secretary shall, unless the proceeding on the complaint is terminated by the Secretary on the basis of a settlement entered into by the Secretary and the person alleged to have committed such violation, issue an order either providing the relief prescribed by subparagraph (B) or denying the complaint. An order of the Secretary shall be made on the record after notice and opportunity for public hearing. The Secretary may not enter into a settlement terminating a proceeding on a complaint without the participation and consent of the complainant.

(B) If, in response to a complaint filed under paragraph (1), the Secretary determines that a violation of subsection (a) has occurred, the Secretary shall order the person who committed such violation to (i) take affirmative action to abate the violation, and (ii) reinstate the complainant to his former position together with the compensation (including back pay), terms, conditions, and privileges of his employment, and the Secretary may

order such person to provide compensatory damages to the complainant. If an order is issued under this paragraph, the Secretary, at the request of the complainant, shall assess against the person against whom the order is issued a sum equal to the aggregate amount of all costs and expenses (including attorneys' and expert witness fees) reasonably incurred, as determined by the Secretary, by the complainant for, or in connection with, the bringing of the complaint upon which the order was issued.

(c)(1) Any person adversely affected or aggrieved by an order issued under subsection (b) may obtain review of the order in the United States court of appeals for the circuit in which the violation, with respect to which the order was issued, allegedly occurred. The petition for review must be filed within sixty days from the issuance of the Secretary's order. Review shall conform to chapter 7 of title 5 of the United States Code. The commencement of proceedings under this subparagraph shall not, unless ordered by the court, operate as a stay of the Secretary's order.

(2) An order of the Secretary with respect to which review could have been obtained under paragraph (1) shall not be subject to judicial review in any criminal or other civil proceeding.

(d) Whenever a person has failed to comply with an order issued under subsection (b)(2), the Secretary may file a civil action in the United States district court for the district in which the violation was found to occur to enforce such order. In actions brought under this subsection, the district courts shall have jurisdiction to grant all appropriate relief including, but not limited to, injunctive relief, compensatory, and exemplary damages.

(e)(1) Any person on whose behalf an order was issued under paragraph (2) of subsection (b) may commence a civil action against the person to whom such order was issued to require compliance with such order. The appropriate United States district court shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce such order.

(2) The court, in issuing any final order under this subsection, may award costs of litigation (including reasonable attorney and expert witness fees) to any party whenever the court determines such award is appropriate.

(f) Any nondiscretionary duty imposed by this section shall be enforceable in a mandamus proceeding brought under section 1361 of title 28 of the United States Code.

(g) Subsection (a) shall not apply with respect to any employee who, acting without direction from his employer (or the employer's agent), deliberately causes a violation of any requirement of this Act.

NATIONAL COMMISSION ON AIR QUALITY

SEC. 323. (a) There is established a National Commission on Air Quality which shall study and report to the Congress on—

(1) available alternatives, including enforcement mechanisms to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and to achieve the other purposes of the Act, including achievement and maintenance of national ambient air quality standards and in accordance with subsection (b)(2) of this section the prevention of significant deterioration of air quality;

(2) the economic, technology, and environmental consequences of achieving or not achieving the purposes of this Act and programs authorized by it;

(3) the technological capability of achieving and the economic, energy, and environmental and health effects of achieving or not achieving required emission control levels for mobile sources of oxides of nitrogen in relation to and independent of regulation of emissions of oxides of nitrogen from stationary sources;

(4) air pollutants not presently regulated, which pose or may in the future pose a threat to public health or public welfare and options available to regulate emissions of such pollutants;

(5) the adequacy of research, development, and demonstrations being carried out by Federal, State, local, and nongovernmental entities to protect and enhance air quality;

(6) the ability of (including financial resources, manpower, and statutory authority) Federal, State, and local institutions to implement the purposes of the Act;

(7) the extent to which the reduction of hydrocarbon emissions is an adequate or appropriate method to achieve primary standards for photochemical oxidants. Such study shall include—

(A) a description and analysis of the various pollutants which are commonly referred to as "photochemical oxidants" or chemical precursers to photochemical oxidants;

(B) an analysis of any pollutants or combination of pollutants which need to be reduced to achieve any photochemical oxidant standard, and the amount of such reduction;

(C) the relationship between the reductions of hydrocarbons, oxides of nitrogen, and any other pollutants and the achievement of applicable standards for photochemical oxidants;

(D) the degree to which background or natural sources and long-range transportation of pollutants contribute to measured ambient levels of photochemical oxidants;

(E) any other oxidant-related issues which the Commission determines to be appropriate; and

(8)(A) the special problems of small businesses and government agencies in obtaining reductions of emissions from existing sources in order to offset increases in emissions from new sources for the purposes of this Act; and

(B) alternative strategies for permitting, without impeding the achievement of national ambient air quality standards as expeditiously as possible, the construction of new facilities and the modification of existing facilities in air quality control regions exceeding the national ambient air quality standard for any pollutant regulated under the Act.

The Commission's study and report under paragraph (4) shall include analysis of the health effects of pollutants which are derivates of oxides of nitrogen.

(b)(1) Studies and investigations conducted pursuant to subsection (a) shall include the effects of existing or proposed national ambient air quality standards on employment, energy, and the economy (including State and local), their relationship to objective scientific and medical data collected to determine their validity at existing levels, as well as their other social and environmental effects.

(2) The Commission shall, in carrying out the study authorized under this section, give priority to a study of the implementation of the provisions of part C of this Act (relating to prevention of significant deterioration of air quality) and its effects on the States and the Federal Government. In carrying out such study, the Commission shall study, among other questions, the following:

(A) whether the provisions relating to the designation of, and protection of air quality in class I areas under part C are appropriate to protect the air quality over lands of special national significance, including recommendations for, and methods to (i) add to or delete lands from such designation, and (ii) provide appropriate protection of the air quality over such lands;

(B) whether the provisions of part C, including the three-hour and twenty-four-hour increments, (i) affect the location and size of major emitting facilities, and (ii) whether such effects are in conflict or consonance with other national policies regarding the development of such facilities;

(C) whether the technology is available to control emissions from the major emitting facilities which are subject to regulation under part C, including an analysis of the costs associated with that technology;

(D) whether the exclusion of nonmajor emitting sources from the regulatory framework under this Act will affect the protection of air quality in class I and class II regions designated under this Act;

(E) whether the increments of change of air quality under this Act are appropriate to prevent significant deterioration of air quality in class I and class II regions designated under part C of title I;

(F) whether the choice of predictive air quality models and the assumptions of those models are appropriate to protect air quality in the class I and class II regions designated under part C of title I for the pollutants subject to regulation under part C; and

(G) the effects of such provisions on employment, energy, the economy (including State and local), the relationship of such policy to the protection of the public health and welfare as well as other national priorities such as economic growth and national defense, and its other social and environmental effects.

(c) The Commission shall, as a part of any study conducted under subsection (b)(2) of this section, specifically identify any loss or irretrievable commitment of resources (taking into account feasibility), including mineral, agricultural and water resources, as well as land surface-use resources.

(d) Such Commission shall be composed of thirteen members, including the chairman and the ranking minority member of the Senate Committee on Public Works and the House Committee on Interstate and Foreign Commence (or delegates of such chairmen or member appointed by them from among representatives of such committees) and nine members of the public appointed by the President. The chairman of the Commission shall be elected from among the members thereof. Not more than one-third of the members of the Commission may have any interest in any business or activity regulated under this Act.

(e) The heads of the departments, agencies, and instrumentalities of the executive branch of the Federal Government shall cooperate with the Commission in carrying out the requirements of this section, and shall furnish to the Commission such information as the Commission deems necessary to carry out this section.

(f) A report, together with any appropriate recommendations, shall be submitted to the Congress on the results of the investigation and study concerning subsection (a)(3) of this section no later than March 1, 1978, and the results of the investigation and study concerning subsection (b)(2) of this section no later than two

years after the date of enactment of the Clean Air Act Amendments of 1977. A report, together with any appropriate recommendations, shall be submitted to the Congress on the results of the investigation and study concerning paragraphs (3) and (8) of subsection (a) of this section no later than March 1, 1978, in order that Congress may have this information in a timely fashion if it deems further changes are needed in the requirements for control of emissions of oxides of nitrogen under this Act, and for other purposes. The Administrator shall undertake to enter into appropriate arrangements with the National Academy of Sciences to conduct a study of the same matters required to be studied by the Commission under subsection (b)(2) and to submit such study to the Congress at the same time as required for the report of the Commission concerning such subsection. Funds shall be available in the same manner, and the Administrator shall have the same authorities and duties respecting such study, as provided in the case of the study authorized pursuant to section 202(c).

(g) A report shall be submitted with regard to all Commission studies and investigations other than those referred to in subsection (f), together with any appropriate recommendations, not later than three years after the date of enactment of this section. Upon submission of such report or upon expiration of such three-year period, whichever is sooner, the Commission shall cease to exist. The members of the Commission who are not officers or employees of the United States, while attending conferences or meetings of the Commission or while otherwise serving at the request of the Chairman shall be entitled to receive compensation at a rate not in excess of the maximum rate of pay for grade GS–18, as provided in the General Schedule under section 5332 of title V of the United States Code, including traveltime and while away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence as authorized by law (5 U.S.C. 73b–2) for persons in the Government service employed intermittently.

(j) In the conduct of the study, the Commission is authorized to contract with nongovernmental entities that are competent to perform research or investigations in areas within the Commission's mandate, and to hold public hearings, forums, and workshops to enable full public participation. The Commission may contract with nonprofit technical and scientific organizations, including the National Academy of Sciences, for the purpose of developing necessary technical information for the study authorized by subsection (a)(7) of this section.[8 9]

[8] This subsection was apparently incorrectly designated as (j) instead of (h) by section 313 of Public Law 95–95. See also footnote 10, p. 170.

[9] The sentence, "The Commission may appoint and fix the pay of such staff as it deems necessary" should appear here instead of at the end of section 324. See p. 170.

COST OF EMISSION CONTROL FOR CERTAIN VAPOR RECOVERY TO BE BORNE BY OWNER OF RETAIL OUTLET

SEC. 324. (a) The regulations under this Act applicable to vapor recovery with respect to mobile source fuels at retail outlets of such fuels shall provide that the cost of procurement and installation of such vapor recovery shall be borne by the owner of such outlet (as determined under such regulations). Except as provided in subsection (b), such regulations shall provide that no lease of a retail outlet by the owner thereof which is entered into or renewed after the date of enactment of the Clean Air Act Amendments of 1977 may provide for a payment by the lessee of the cost of procurement and installation of vapor recovery equipment. Such regulations shall also provide that the cost of procurement and installation of vapor recovery equipment may be recovered by the owner of such outlet by means of price increases in the cost of any product sold by such owner, notwithstanding any provision of law.

(b) The regulations of the Administrator referred to in subsection (a) shall permit a lease of a retail outlet to provide for payment by the lessee of the cost of procurement and installation of vapor recovery requirement over a reasonable period (as determined in accordance with such regulations), if the owner of such outlet does not sell, trade in, or otherwise dispense any product at wholesale or retail at such outlet.

The Commission may appoint and fix the pay of such staff as it deems necessary.[10]

VAPOR RECOVERY FOR SMALL BUSINESS MARKETERS OF PETROLEUM PRODUCTS

SEC. 325. (a) The regulations under this Act applicable to vapor recovery from fueling of motor vehicles at retail outlets of gasoline shall not apply to any outlet owned by an independent small business marketer of gasoline having monthly sales of less than 50,000 gallons. In the case of any other outlet owned by an independent small business marketer, such regulations shall provide, with respect to independent small business marketers of gasoline, for a three-year phase-in period for the installation of such vapor recovery equipment at such outlets under which such marketers shall have—

(1) 33 percent of such outlets in compliance at the end of the first year during which such regulations apply to such marketers,

(2) 66 percent at the end of such second year, and

(3) 100 percent at the end of the third year.

[10] Language concerning staff of the National Commission on Air Quality was apparently intended to be inserted after "(j)" in section 323(j) and not in section 324. See section 14(a)(82) of Public Law 95–190.

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(b) Nothing in subsection (a) shall be construed to prohibit any State from adopting or enforcing, with respect to independent small business marketers of gasoline having monthly sales of less than 50,000 gallons, any vapor recovery requirements for mobile source fuels at retail outlets. Any vapor recovery requirement which is adopted by a State and submitted to the Administrator as part of its implementation plan may be approved and enforced by the Administrator as part of the applicable implementation plan for that State.

(c) For purposes of this section, an independent small business marketer of gasoline is a person engaged in the marketing of gasoline who would be required to pay for procurement and installation of vapor recovery equipment under section 324 of this Act or under regulations of the Administrator, unless such person—

(1) (A) is a refiner, or

(B) controls, is controlled by, or is under common control with, a refiner.

(C) is otherwise directly or indirectly affiliated (as determined under the regulations of the Administrator) with a refiner or with a person who controls, is controlled by, or is under a common control with a refiner (unless the sole affiliation referred to herein is by means of a supply contract or an agreement or contract to use a trademark, trade name, service mark, or other identifying symbol or name owned by such refiner or any such person), or

(2) receives less than 50 percent of his annual income from refining or marketing of gasoline.

For the purpose of this section, the term "refiner" shall not include any refiner whose total refinery capacity (including the refinery capacity of any person who controls, is controlled by, or is under common control with, such refiner) does not exceed 65,000 barrels per day. For purposes of this section, "control" of a corporation means ownership of more than 50 percent of its stock.

CONSTRUCTION OF CERTAIN CLAUSES

SEC. 326. The parenthetical cross references in any provision of this Act to other provisions of the Act, or other provisions of law, where the words "relating to" or "pertaining to" are used, are made only for convenience, and shall be given no legal effect.

APPROPRIATIONS

SEC. 327. (a) There are authorized to be appropriated to carry out this Act (other than provisions for which amounts are authorized under subsection (b)), $200,000,000 for the fiscal year 1978 and for each of the three fiscal years beginning thereafter.

(b) (1) There are authorized to be appropriated to carry out section 175 beginning in fiscal year 1978, $75,000,000 to be available until expended.

(2) There are authorized to be appropriated for use in carrying out section 323 (relating to National Commission on Air Quality), not to exceed $10,000,000 beginning in fiscal year 1978. For the study authorized under section 323 there shall be made available by contract to the National Commission on Air Quality from the appropriation to the Environmental Protection Agency for fiscal year 1977 the sum of $1,000,000.

(3) There are authorized to be appropriated to carry out section 127 (relating to grants for public notification) $4,000,000 for the fiscal year 1978 and each of the three succeeding fiscal years.

(4) For purposes of section 103(a)(5), there are authorized to be appropriated $7,500,000 for the fiscal year 1978 and each of the three fiscal years beginning after the date of enactment of the Clean Air Act Amendments of 1977.

(5) For the purpose of carrying out the provisions of part B of title I relating to studies and reports, there are authorized to be appropriated—

(A) to the National Aeronautics and Space Administration, the National Science Foundation, and the Department of State, such sums as may be necessary for the fiscal year ending September 30, 1977, and the fiscal year ending September 30, 1978;

(B) to the Environmental Protection Agency, $157,000,000 for fiscal year 1978; and

(C) to all other agencies such sums as may be necessary.

(6) There are authorized to be appropriated for carrying out research, development and demonstration under sections 103 and 104 of this Act $120,000,000 for fiscal year 1978.

PROVISIONS OF PUBLIC LAW 95-95 WHICH DO NOT AMEND THE CLEAN AIR ACT

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TRAINING

SEC. 101. (a) * * *

* * * * *

(c) The Administrator of the Environmental Protection Agency shall consult with the House Committee on Science and Technology on the environmental and atmospheric research, development, and demonstration aspects of this Act. In addition, the reports and studies required by this Act that relate to research, development, and demonstration issues shall be transmitted to the Committee on Science and Technology at the same time they are made available to other committees of the Congress.

* * * * *

COMPLIANCE ORDERS (INCLUDING COAL CONVERSION)

SEC. 112. (a) * * *

* * * * *

(b)(1) Section 119 of such Act is hereby repealed. All references to such section 119 or subsections thereof in section 2 of the Energy Supply and Environmental Coordination Act of 1974 (Public Law 93-319) or any amendment thereto, or any subsequent enactment which supersedes such Act, shall be construed to refer to section 113(d) of the Clean Air Act and to paragraph (5) thereof in particular. Any certification or notification required to be given by the Administrator of the Environmental Protection Agency under section 2 of the Energy Supply and Environmental Coordination Act of 1974 or any amendment thereto, or any subsequent enactment which supersedes such Act, shall be given only when the Governor of the State in which is located the source to which the proposed order under section 113(d)(5) of the Clean Air Act is to be issued gives his prior written concurrence.

(2) In the case of any major stationary source to which any requirement is applicable under section 113(d)(5)(B) of the Clean Air Act and for which certification is required under section 2 of the Energy Supply and Environmental Coordination Act of 1974 or any amendment thereto, or any subsequent enactment which

supersedes such Act, the Administrator of the Environmental Protection Agency shall certify the date which he determines is the earliest date that such source will be able to comply with all such requirements. In the case of any plant or installation which the Administrator of the Environmental Protection Agency determines (after consultation with the State) will not be subject to an order under section 113(d) of the Clean Air Act and for which certification is required under section 2 of the Energy Supply and Environmental Coordination Act of 1974 or any amendment thereto, or any subsequent enactment which supersedes such Act, the Administrator of the Environmental Protection Agency shall certify the date which he determines is the earliest date that such plant or installation will be able to burn coal in compliance with all applicable emission limitations under the implementation plan.

(3) Any certification required under section 2 of the Energy Supply and Environmental Coordination Act of 1974 or any amendment thereto, or any subsequent enactment which supersedes such Act, or under this subsection may be provided in an order under section 113(d) of the Clean Air Act.

* * * * *

UNREGULATED POLLUTANTS

SEC. 120. (a) * * *

* * * * *

(b) The Administrator of the Environmental Protection Agency shall conduct a study, in conjunction with other appropriate agencies, concerning the effect on the public health and welfare of sulfates, radioactive pollutants, cadmium, arsenic, and polycyclic organic matter which are present or may reasonably be anticipated to occur in the ambient air. Such study shall include a thorough investigation of how sulfates are formed and how to protect public health and welfare from the injurious effects, if any, of sulfates, cadmium, arsenic, and polycyclic organic matter.

* * * * *

PREVENTION OF SIGNIFICANT DETERIORATION

SEC. 127. (a) * * *

* * * * *

(b) Within one year from the date of enactment of this Act the Administrator shall report to the Congress on the consequences of that portion of the definition of "major emitting facility" under the amendment made by subsection (a) which applies to facilities with the potential to emit two hundred and fifty tons per year or more. Such study shall examine the type of facilities covered, the air quality benefits of including such facilities, and the administrative aspect of regulating such facilities.

(c) Not later than one year after the date of enactment of this Act, the Administrator shall publish a guidance document to assist the States in carrying out their functions under part C of title I of the Clean Air Act (relating to prevention of significant deterioration of air quality) with respect to pollutants, other than sulfur oxides and particulates, for which national ambient air quality standards are promulgated. Such guidance document shall include recommended strategies for controlling photochemical oxidants on a regional or multistate basis for the purpose of implementing part C and section 110 of such Act.

(d) Not later than two years after the date of enactment of this Act, the Administrator shall complete a study and report to the Congress on the progress made in carrying out part C of title I of the Clean Air Act (relating to significant deterioration of air quality) and the problems associated with carrying out such section, including recommendations for legislative changes necessary to implement strategies for controlling photochemical oxidants on a regional or multistate basis.

* * * * *

NONATTAINMENT AREAS

SEC. 129. (a)(1) Before July 1, 1979, the interpretative regulation of the Administrator of the Environmental Protection Agency published in 41 Federal Register 55524–30, December 21, 1976, as may be modified by rule of the Administrator, shall apply except that the baseline to be used for determination of appropriate emission offsets under such regulation shall be the applicable implementation plan of the State in effect at the time of application for a permit by a proposed major stationary source (within the meaning of section 302 of the Clean Air Act).

(2) Before July 1, 1979, the requirements of the regulation referred to in paragraph (1) shall be waived by the Administrator with respect to any pollutant if he determines that the State has—

(A) an inventory of emissions of the applicable pollutant for each nonattainment area (as defined in section 171 of the Clean Air Act) that identifies the type, quantity, and source of such pollutant so as to provide information sufficient to demonstrate that the requirements of subparagraph (C) are being met;

(B) an enforceable permit program which—

(i) requires new or modified major stationary sources to meet emission limitations at least as stringent as required under the permit requirements referred to in paragraphs (2) and (3) of section 173 of the Clean Air Act (relating to lowest achievable emission rate and compliance by other sources) and which assures com-

pliance with the annual reduction requirements of subparagraph (C); and

(ii) requires existing sources to achieve such reduction in emissions in the area as may be obtained through the adoption, at a minimum of reasonably available control technology, and

(C) a program which requires reductions in total allowable emissions in the area prior to July 1, 1979, so as to provide for the same level of emission reduction as would result from the application of the regulation referred to in paragraph (1).

The Administrator shall terminate such waiver if in his judgment the reduction in emissions actually being attained is less than the reduction on which the waiver was conditioned pursuant to subparagraph (C), or if the Administrator determines that the State is no longer in compliance with any requirement of this paragraph. Upon application by the State, the Administrator may reinstate a waiver terminated under the preceding sentence if he is satisfied that such State is in compliance with all requirements of this subsection.

(3) Operating permits may be issued to those applicants who were properly granted construction permits, in accordance with the law and applicable regulations in effect at the time granted, for construction of a new or modified source in areas exceeding national primary air quality standards on or before the date of the enactment of this Act if such construction permits were granted prior to the date of the enactment of this Act and the person issued any such permit is able to demonstrate that the emissions from the source will be within the limitations set forth in such construction permit.

* * * * *

(c) Notwithstanding the requirements of section 406(d)(2) (relating to date required for submission of certain implementation plan revisions), for purposes of section 110(a)(2) of the Clean Air Act each State in which there is any nonattainment area (as defined in part D of title I of the Clean Air Act) shall adopt and submit an implementation plan revision which meets the requirements of section 110(a)(2)(I) and part D of title I of the Clean Air Act not later than January 1, 1979. In the case of any State for which a plan revision adopted and submitted before such date has made the demonstration required under section 172(a)(2) of the Clean Air Act (respecting impossibility of attainment before 1983), such State shall adopt and submit to the Administrator a plan revision before July 1, 1982, which meets the requirements of section 172 (b) and (c) of such Act.

* * * * *

STUDIES AND RESEARCH OBJECTIVES FOR OXIDES OF NITROGEN

SEC. 202. (a) The Administrator of the Environmental Protection Agency shall conduct a study of the public health implications of attaining an emission standard on oxides of nitrogen from light duty vehicles of 0.4 gram per vehicle mile, the cost and technological capability of attaining such standard, and the need for such a standard to protect public health or welfare. The Administrator shall submit a report of such study to the Congress, together with recommendations not later than July 1, 1980.

* * * * *

STUDY AND REPORT OF FUEL CONSUMPTION

SEC. 203. (a) Following each motor vehicle model year, the Administrator of the Environmental Protection Agency shall report to the Congress respecting the motor vehicle fuel consumption associated with the standards applicable for the immediately preceding model year.

(b) The Secretary of Transportation and the Secretary of Energy shall each submit to Congress, as promptly as practicable following submission by the Administrator of the fuel consumption report referred to in subsection (a), separate reports respecting such fuel consumption.

* * * * *

CARBON MONOXIDE INTRUSION INTO SUSTAINED USE VEHICLES

SEC. 226. (a) The Administrator, in conjunction with the Secretary of Transportation, shall study the problem of carbon monoxide intrusion into the passenger area of sustained-use motor vehicles. Such study shall include an analysis of the sources and levels of carbon monoxide in the passenger area of such vehicles and a determination of the effects of carbon monoxide upon the passengers. The study shall also review available methods of monitoring and testing for the presence of carbon monoxide and shall analyze the cost and effectiveness of alternative methods of monitoring and testing. The study shall analyze the cost and effectiveness of alternative strategies for attaining and maintaining acceptable levels of carbon monoxide in the passenger area of such vehicles. Within one year the Administrator shall report to the Congress respecting the results of such study.

(b) For the purpose of this section, the term "sustained-use motor vehicle" means any diesel or gasoline fueled motor vehicle (whether light or heavy duty) which, as determined by the Administrator (in conjunction with the Secretary), is normally used and occupied for a sustained, continuous, or extensive period of time, including buses, taxicabs, and police vehicles.

* * * * *

INTERAGENCY COOPERATION ON PREVENTION OF ENVIRONMENTAL CANCER AND HEART AND LUNG DISEASE

SEC. 402. (a) Not later than three months after the date of enactment of this section, there shall be established a Task Force on Environmental Cancer and Heart and Lung Disease (hereinafter referred to as the 'Task Force'). The Task Force shall include representatives of the Environmental Protection Agency, the National Cancer Institute, the National Heart, Lung, and Blood Institute, the National Institute of Occupational Safety and Health, and the National Institute on Environmental Health Sciences, and shall be chaired by the Administrator (or his delegate).

(b) The Task Force shall—

(1) recommend a comprehensive research program to determine and quantify the relationship between environmental pollution and human cancer and heart and lung disease;

(2) recommend comprehensive strategies to reduce or eliminate the risks of cancer or such other diseases associated with environmental pollution;

(3) recommend research and such other measures as may be appropriate to prevent or reduce the incidence of environmentally related cancer and heart and lung diseases;

(4) coordinate research by, and stimulate cooperation between, the Environmental Protection Agency, the Department of Health, Education, and Welfare, and such other agencies as may be appropriate to prevent environmentally related cancer and heart and lung diseases; and

(5) report to Congress, not later than one year after the date of enactment of this section and annually thereafter, on the problems and progress in carrying out this section.

STUDIES

SEC. 403. (a) Not later than eighteen months after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency, in cooperation with the National Academy of Sciences, shall study and report to Congress on (1) the relationship between the size, weight, and chemical composition of suspended particulate matter and the nature and degree of the endangerment to public health or welfare presented by such particulate matter (especially with respect to fine particulate matter) and (2) the availability of technology for controlling such particulate matter.

(b) The Administrator of the Environmental Protection Agency shall conduct a study and report to the Congress not later than January 1, 1979, on the effects

on public health and welfare of odors or odorous emissions, the sources of such emissions, the technology or other measures available for control of such emissions and the costs of such technology or measures, and the costs and benefits of alternative measures or strategies to abate such emissions. Such report shall include an evaluation of whether air quality criteria or national ambient air quality standards should be published under the Clean Air Act for odors, and what other strategies or authorities under the Clean Air Act are available or appropriate for abating such emissions.

(c) (1) Not later than twelve months after the date of enactment of this Act the Administrator of the Environmental Protection Agency shall publish throughout the United States a list of all known chemical contaminants resulting from environmental pollution which have been found in human tissue including blood, urine, breast milk, and all other human tissue. Such list shall be prepared for the United States and shall indicate the approximate number of cases, the range of levels found, and the mean levels found.

(2) Not later than eighteen months after the date of enactment of this Act the Administrator shall publish in the same manner an explanation of what is known about the manner in which the chemicals described in paragraph (1) entered the environment and thereafter human tissue.

(3) The Administrator, in consultation with National Institutes of Health, the National Center for Health Statistics, and the National Center for Health Services Research and Development, shall, if feasible, conduct an epidemiological study to demonstrate the relationship between levels of chemicals in the environment and in human tissue. Such study shall be made in appropriate regions or areas of the United States in order to determine any different results in such regions or areas. The results of such study shall, as soon as practicable, be reported to the appropriate committee of the Congress.

(d) The Administrator of the Environmental Protection Agency shall conduct a study of air quality in various areas throughout the country including the gulf coast region. Such study shall include analysis of liquid and solid aerosols and other fine particulate matter and the contribution of such substances to visibility and public health problems in such areas. For the purposes of this study, the Administrator shall use environmental health experts from the National Institutes of Health and other outside agencies and organizations.

(e) (1) The Secretary of Labor, in consultation with the Administrator, shall conduct a study of potential dislocation of employees due to implementation of laws administered by the Administrator. Such study shall estimate the number of employees so affected, identify exist-

ing sources of assistance available to such employees, assess the adequacy of such assistance, and recommend additional adjustment measures, if justified.

(2) The Secretary shall submit to Congress the results of the study conducted under paragraph (1) not more than one year after the date of enactment of this section.

(f) The Administrator of the Environmental Protection Agency shall undertake to enter into appropriate arrangements with the National Academy of Sciences to conduct continuing comprehensive studies and investigations of the effects on public health and welfare of emissions subject to section 202(a) of the Clean Air Act (including sulfur compounds) and the technological feasibility of meeting emission standards required to be prescribed by the Administrator by section 202(b) of such Act. The Administrator shall report to the Congress within six months of the date of enactment of this section and each year thereafter regarding the status of the contractual arrangements and conditions necessary to implement this paragraph.

(g) The Administrator of the Environmental Protection Agency shall conduct a study and report to Congress by the date one year after the date of the enactment of this section, on the emission of sulfur-bearing compounds from motor vehicles and motor vehicle engines and aircraft engines. Such study and report shall include but not be limited to a review of the effects of such emissions on public health and welfare and an analysis of the costs and benefits of alternatives to reduce or eliminate such emissions (including desulfurization of fuel, short-term allocation of low sulfur crude oil, technological devices used in conjunction with current engine technologies, alternative engine technologies, and other methods) as may be required to achieve any proposed or promulgated emission standards for sulfur compounds.

RAILROAD EMISSION STUDY

SEC. 404. (a) The Administrator of the Environmental Protection Agency shall conduct a study and investigation of emissions of air pollutants from railroad locomotives, locomotive engines, and secondary power sources on railroad rolling stock, in order to determine—

(1) the extent to which such emissions affect air quality in air quality control regions throughout the United States,

(2) the technological feasibility and the current state of technology for controlling such emissions, and

(3) the status and effect of current and proposed State and local regulations affecting such emissions.

(b) Within one hundred and eighty days after commencing such study and investigation, the Administrator shall submit a report of such study and investigation,

together with recommendations for appropriate legislation, to the Senate Committee on Environment and Public Works and the House Committee on Interstate and Foreign Commerce.

STUDY AND REPORT CONCERNING ECONOMIC APPROACHES TO CONTROLLING AIR POLLUTION

SEC. 405. (a) The Administrator, in conjunction with the Council of Economic Advisors (hereinafter in this section referred to as 'the Council'), shall undertake a study and assessment of economic measures for the control of air pollution which could—

(1) strengthen the effectiveness of existing methods of controlling air pollution,

(2) provide incentives to abate air pollution to a greater degree than is required by existing provisions of the Clean Air Act (and regulations thereunder), and

(3) serve as the primary incentive for controlling air pollution problems not addressed by any provision of the Clean Air Act (or any regulation thereunder).

(b) The study of measures referred to in paragraph (1) of subsection (a) shall concentrate on (1) identification of air pollution problems for which existing methods of control are not effective because of economic incentives to delay compliance and (2) formulation of economic measures which could be taken with respect to each such air pollution problem which would provide an incentive to comply without interfering with such existing methods of control.

(c) The study of measures referred to in paragraph (2) of subsection (a) shall concentrate on (1) identification of air pollution problems for which existing methods of control may not be sufficiently extensive to achieve all desired environmental goals and (2) formulation of economic measures for each such air pollution problem which would provide additional incentives to reduce air pollution without—

(A) interfering with the effectiveness of existing methods of control, or

(B) creating problems similar to those which prevent alternative regulatory methods from being used to reach such environmental goals.

(d) The study of the measures referred to in paragraph (3) of subsection (a) shall concentrate on (1) identification of air pollution problems for which no existing methods of control exist, (2) formulation of economic measures to reduce such pollution, and (3) comparison of the environmental and economic impacts of the economic measures with those of any alternative regulatory methods which can be identified.

(e) In conducting the study under this section, a preliminary screening should be made of the problems referred to in subsections (b)(1), (c)(1), and (d)(1) and economic measures should be formulated under subsections (b)(2), (c)(2), and (d)(2) in the most promising cases, giving special attention to structural and administrative problems. In formulating any such measure which provides for a charge, the appropriate level of the charge should be determined, if possible, and the environmental and economic impacts should be identified.

(f) Within one year after the date of enactment of this Act, the Administrator shall complete a study and report to the Congress on the advantages and disadvantages (including an analysis of the feasibility) of establishing a system of penalties for stationary sources on emissions of oxides of nitrogen and make recommendations regarding the establishment of such a system. Such study shall determine if such a system will effectively encourage the development of more effective systems and technologies for control of emissions of oxides of nitrogen for new major emitting facilities, or existing major emitting facilities, or both. In any case in which a proposed penalty system is recommended by the Administrator, the report should include—

(1) a recommendation respecting the appropriate period during which such system of penalties should apply, and the appropriate termination date or dates for such system, if any, taking into account—

(A) the time at which adequate technology may reasonably be anticipated to be available to control oxides of nitrogen for that category of facilities,

(B) the degree to which such technology can be expected to be used on such facilities, and

(C) the Administrator's authorities to require the use of such technology, and

(2) recommendations respecting the compilation of records by facilities subject to such penalties for purposes of determining the applicability and amount of such penalty.

(g) Not later than two years after the date of the enactment of this section, the Administrator and the Council shall conclude the study and assessment under this section and submit a report containing the results thereof to the President and to the Congress. Interim reports on specific pollution problems and solutions recommended shall be made available to the President and the Congress by the Administrator whenever available.

SAVING PROVISION; EFFECTIVE DATES

SEC. 406. (a) No suit, action, or other proceeding lawfully commenced by or against the Administrator or any

other officer or employee of the United States in his official capacity or in relation to the discharge of his official duties under the Clean Air Act, as in effect immediately prior to the date of enactment of this Act shall abate by reason of the taking effect of the amendments made by this Act. The court may, on its own motion or that of any party made at any time within twelve months after such taking effect, allow the same to be maintained by or against the Administrator or such officer or employee.

(b) All rules, regulations, orders, determinations, contracts, certifications, authorizations, delegations, or other actions duly issued, made, or taken by or pursuant to the Clean Air Act as in effect immediately prior to the date of enactment of this Act, and pertaining to any functions, powers, requirements, and duties under the Clean Air Act, as in effect immediately prior to the date of enactment of this Act, and not suspended by the Administrator or the courts, shall continue in full force and effect after the date of enactment of this Act until modified or rescinded in accordance with the Clean Air Act as amended by this Act.

(c) Nothing in this Act nor any action taken pursuant to this Act shall in any way affect any requirement of an approved implementation plan in effect under section 110 of the Clean Air Act or any other provision of the Act in effect under the Clean Air Act before the date of enactment of this section until modified or rescinded in accordance with the Clean Air Act as amended by this Act.

(d)(1) Except as otherwise expressly provided, the amendments made by this Act shall be effective on date of enactment.

(2) Except as otherwise expressly provided, each State required to revise its applicable implementation plan by reason of any amendment made by this Act shall adopt and submit to the Administrator of the Environmental Protection Administration such plan revision before the later of the date—

(A) one year after the date of enactment of this Act, or

(B) nine months after the date of promulgation by the Administrator of the Environmental Protection Administration of any regulations under an amendment made by this Act which are necessary for the approval of such plan revision.

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Special Report

Stationary Source Compliance Series Publications

(As of June 1, 1985)

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Stationary Source Compliance Division
Washington DC 20460

June 1985

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NEW SOURCE PERFORMANCE STANDARDS

EPA No.	Title
340/1-75-001 PB-246087	Inspection Manual for Enforcement of New Source Performance Standards - Portlant Cement Plants
340/1-75-002 PB-246087	(ibid) Fossil-Fired Steam Generators
340/1-75-003 PB-245848	(ibid) Municipal Incinerators
340/1-75-004 PB-246112	(ibid) Sewage Sludge Incinerators
340/1-76-003 PB-252264/A05	(ibid) Asphalt Concrete Plants
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340/1-77-005 PB-270082	(ibid) Volatile Hydrocarbon Storage
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340/1-77-008 PB-277015	(ibid) Sulfuric Acid Production (H_2SO_4)
340/1-77-009 PB-271931	(ibid) Phosphate Fertilizer Plants (H_3PO_4)
340/1-77-019 PB-271931	(ibid) Fuel Gas-Fired Combustion Units (Refineries)
340/1-77-022 PB-27426/5	(ibid) Coal Preparation Plants

NEW SOURCE PERFORMANCE STANDARDS (Continued)

EPA No.	Title
340/1-82-005a	Compilation of Standards of Performance for New Stationary Sources (As of May 1, 1982) - Volume 1: Introduction, Summary and Standards
340/1-82-005b	Compilation of Standards of Performance for New Stationary Sources (As of May 1, 1982) - Volume 2: Proposed Standards
340/1-82-005c	Compilation of Standards of Performance for New Stationary Sources (As of May 1, 1982) - Volume 3: Full Text of All New and Revised Standards
340/1-83-005a	Compilation of Standards of Performance for New Stationary Sources (As of January 1, 1983) - Volume 1: Introduction, Summary and Standards [Supplement to 340/1-82-005a]
340/1-83-005b	Compilation of Standards of Performance for New Stationary Sources (As of January 1, 1983) - Volumes 2 and 3: Proposed Standards and Full Text of New and Revised Standards [Combined Supplement to 340/1-82-005b and 340/1-82-005c]
340/1-84-009	Compilation Guide of Procedural Decisions on EPA. NSPS Reference Methods
340/1-84-013	Nitric Acid Plant Inspection Guide
340/1-85-005a	Compilation of Standards of Performance for New Stationary Sources - Volume 1: Introduction, Summary and Standards (As of December 31, 1984)
340/1-85-005b	Compilation of Standards of Performance for New Stationary Sources - Volume 2: Proposed Standards (As of December 31, 1984) - [Supplement to 340/1-82-005b and 340/1-83-005b]
340/1-85-005c	Compilation of Standards for New Stationary Sources - Volume 3: Full Text of New and Revised Standards (As of December 31, 1984) [Supplement to 340/1-82-005c and 340/1-83-005b)

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

EPA No.	Title
S.22	Demolition and Renovation Inspection Procedures
340/1-78-010 PB-289778	National Emission Standards for Hazardous Air Pollutants: Inspection Manual for Vinyl Chloride
340/1-82-006	Compilation of National Emission Standards for Hazardous Air Pollutants (As of August 1, 1982)
340/1-85-006	Compilation of National Emission Standards for Hazardous Air Pollutants (As of December 31, 1985) - [Supplement to 340/1-82-006]

VOC SOURCE INSPECTION AND COMPLIANCE TECHNOLOGY

EPA No.	Title
340/1-77-010 PB-274140	Stage I Vapor Recovery and Small Bulk Plants in Washington, D.C., Baltimore, Houston, and Galveston, Texas
340/1-77-013 PB-269884	Economic Analysis of Vapor Recovery System on Small Bulk Plants
340/1-77-014 PB-272444	Evaluation of Top Loading Vapor Balance Systems for Small Bulk Plants
340/1-78-010 PB-289778/A06	Inspection Manual for Vinyl Chloride
340/1-79-008 PB-125743/A04	Inspection Manual for Enforcement of Reasonably Available Control Technology - Degreasers
340/1-79-110	Executive Summary: Enforcement Implications of RACT for the Cutback Asphalt Industry
340/1-80-005 PB-203565/A05	Enforceability Aspects for Factory Surface Coating of Flat Wood Paneling
340/1-80-007 PB-186105	RACT Compliance Guidelines for Carbon Adsorbers on Perchloroethylene Dry Cleaners
340/1-80-008 PB84-188861	Petroleum Refinery Enforcement Manual
340/1-80-010 PB84-186857	Summary of Available Portable VOC Detection Instruments
340/1-80-011	Techniques to Detect Failure in Carbon Adsorption Systems
340/1-80-012 PB84-186840	Inspection Manual for Control of Volatile Organic Emissions From Gasoline Marketing Operations
340/1-80-013 PB-190016	Development of VOC Compliance Monitoring and Enforcement Strategies: The Wholesale Gasoline Marketing Chain, Volumes I and II
340/1-80-015 PB-189612	RACT for the Use of Cutback Asphalts in Road Construction and Maintenance: Enforcement Implications and Equipment
340/1-80-016 PB-189380	Enforceability Aspects of RACT for the Chemical Synthesis Pharmaceutical Industry

VOC SOURCE INSPECTION AND COMPLIANCE TECHNOLOGY

EPA No.

340/1-80-017 RACT Enforceability Aspects for Pneumatic Tire Manufacturing
PB-193622

340/1-85-001 Guideline for Surface Coating Calculations

INDUSTRIAL PROCESS CONTROL EQUIPMENT INSPECTION AND EVALUATION

EPA No.	Title
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340/1-79-007 PB-299959/7	Inspection Procedures for Evaluation of Electrostatic Precipitator Control System Performance
340/1-80-020	Summary of Factors Affecting Compliance by Ferrous Foundries: Volume I
340/1-81-020a	Summary of Factors Affecting Compliance by Ferrous Foundries: Volume II - Appendices A-E
340/1-81-020b	Summary of Factors Affecting Compliance by Ferrous Foundries: Volume II - Appendices A-F
340/1-81-005 PB-149419/A06	Ferrous Foundry Inspection Guide
340/1-82-007 PB-153551/A07	Portland Cement Plant Inspection Guide
340/1-83-017 PB84-193705	Kraft Pulp Mill Inspection Guide
340/1-83-019 PB84-102300	Envirotech/Cemico Pushing Emissions Control Systems Analysis
340/1-83-021 PB84-128339	Development of Pilot Inspection System for Virginia State Air Pollution Control Board
340/1-83-022 PB85-149375	Wet Scrubber Inspection and Evaluation
340/1-83-023 PB84-210129	Optimization of Small Coal-Fired and Oil Fired Industrial Boiler Operation to Reduce Emissions
340/1-83-025 PB85-180867	Coal-Fired Industrial Boiler Inspection Guide
340/1-84-017	Guidelines on Preferred Locations and Design of Measurement Ports for Air Pollution Control Systems
340/1-84-013	Nitric Acid Plant Inspection Guide

INDUSTRIAL PROCESS CONTROL EQUIPMENT INSPECTION AND EVALUATION

(Continued)

EPA No.	Title
340/1-84-012 PB85-180875	Performance Evaluation Guide for Large Flow Ventilation Systems
340/1-85-003	Inspection and Operating and Maintenance Guideline for Secondary Lead Smelter Air Pollution Control
[Pub. No. to be assigned by EPA/CERI]	Operation and Maintenance Manual for Electrostatic Precipitators (Completion date August 1985)
[Pub. No. to be assigned by EPA/CERI]	Operation and Maintenance Manual for Fabric Filters (Completion date October 1985)
[Pub. No. to be assigned by EPA/CERI]	FGD Inspection and Performance Evaluation Manual (Completion date August 1985)

EMISSION TESTING AND CONTINUOUS EMISSION MONITORING

EPA No.	Title
340/1-76-005 PB-258853	Application of Remote Techniques in Stationary Sources Emission Monitoring
340/1-77-016A PB-279006	Survey of Techniques for Monitoring Sewage Sludge Charged to Municipal Sludge Incinerators
340/1-78-005A PB-283433	Manual 1 - Source Selection and Location of Continuous Monitoring Systems - Resource Manual For Implementing the NSPS Continuous Monitoring Regulations
340/1-78-005B PB-283434	Manual 2 - Preliminary Activities for Continuous Monitoring System Certification - Resource Manual For Implementing the NSPS Continuous Monitoring Regulations
340/1-78-005C PB-283435	Manual 3 - Procedures for Agency Review of Excess Emission Reports - Resource Manual for Implementing the NSPS Continuous Monitor - Regulations
340/1-78-005D PB-283436	Manual 4 - Source Operating and Maintenance Procedures For Continuous Monitoring Systems - Resource Manual For Implementing the NSPS Continuous Monitoring Regulations
340/1-80-019	Correlation of Remote and Wet Chemical Sampling Techniques For Hydrogen Fluoride from Gypsum Ponds
340/1-83-007 PB-127208/A04	An Introduction to Continuous Emission Monitoring Programs
340/1-83-009 PB-126671/A04	Guidelines for the Observation of Performance Specification Tests of Continuous Emission Monitors
340/1-83-010 PB-126689/A08	Performance Audit Procedures for Opacity Monitors
340/1-83-011 PB84-128321	A Compilation of Opacity Monitor Performance Audit Results
340/1-83-012 PB-127752/A03	A Compilation of SO_2 and NO_2 Continuous Emission Monitor Reliability Information

EMISSION TESTING AND CONTINUOUS EMISSION MONITORING GUIDES (Continued)

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340/1-83-013 PB-128354/A20	Performance Specification Tests for Pollutant and Dilutent Gas Emission Monitors: Reporting Requirements, Report Format, and Review Procedures
340/1-83-015 PB84-128362	Performance Audit Procedures for SO_2, NO_x, CO_2, and O_2 Continuous Emission Monitors
340/1-83-016 PB-126978/A04	Transportable Continuous Emission Monitoring System Operational Protocols: Instrument Monitoring of SO_2, NO_x, and CO_2 Effluent Concentrations
340/1-84-015	Technical Guideline on Review and Use of Excess Emission Reports
340/1-84-016	Summary of Opacity and Gas Audit Programs

VISIBLE EMISSION OBSERVATION GUIDES

EPA No.	Title
340/1-75-007 PB 247675	Guidelines for Evaluation of Visible Emissions: Certification Field Procedures, Legal Aspects, and Background Materials
340/1-79-003	EPA Visible Emissions Inspection Guide (S.24)
600/4-83-011 PB83-193656	Technical Assistance Document: Quality Assurance Guideline for Visible Emission Training Schools
600/4-77-027b PB80-112303	Quality Assurance Handbook for Air Pollution Measurement System: Volume 3, Section 3.12 - Method 9 Field Observation Procedures

CONTINUOUS COMPLIANCE INVESTIGATIONS AND STUDIES

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905/2-80-002	Design Considerations for Minimizing Operation and Maintenance Problems of Particulate Control Equipment
340/1-81-002	An Evaluation of Corrosion in Particulate Control Equipment
340/1-83-021 PB84-128339	Development of Pilot Inspection System for Virginia State Air Pollution Control Board
340/1-83-024a PB85-157576/AS	Study of Ambient TSP Levels Near Major Steel Facilities (1978-1980) - Volume 1
340/1-83-024b PB85-157568/AS	Study of Ambient TSB Levels Near Major Steel Facilities (1978-1980) - Volume 2

EMISSIONS CONTROL TECHNOLOGY EVALUATION

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905/2-76-001 PB-252650	Technological Problems of Burning Low Sulfur Western Coal
905/4-76-002 PB-251910	Emissions from Hot-Dip Galvanizing Processes
340/1-76-002 PB-251985	Combustion of Wood Residue in Conical (Wigwam) Burners, Emission Control and Alternatives
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340/1-77-017 PB-276138	Revised Technical Guide for Review and Evaluation of Compliance Schedules for Air Pollution Sources
340/1-77-026 PB-278483	Control of Particulate Emissions from Wood-Fired Boilers
340/1-78-001 PB-283470 PB-282412	Jet Engine Test Cells - Emissions and Control Measures: Volumes 1 and 2
340/1-79-002 PB80-131840	Control of Air Emissions from Process Operations in Rock Crushing Plants
340/1-80-018 PB81-200420	Annotated Bibliography of Literature on Flue Gas Conditioning

COMPLIANCE DATA MANAGEMENT AND ANALYSIS

EPA No.	Title
340/1-83-020 PB-270363	Compliance Data System User's Guide
340/1-83-024a	Study of Ambient TSB Levels Near Major Steel Facilities (1978-1980): Volume 1
340/1-83-024b PB85-157576/AS	Study of Ambient TSB Levels Near Major Steel Facilities (1978-1980): Volume 2
340/1-84-011 PB85-157568/AS	Compliance Data System Quality Assurance Manual

COMPLIANCE MONITORING AND SURVEILLANCE PROGRAM DEVELOPMENT

EPA No.	Title
340/1-75-008 PB-247789	Guidelines and Enforcement and Surveillance of Supplementary Control Systems, Volumes I and II
340/1-77-017 PB-276138	Revised Technical Guide for Review and Evaluation of Compliance Schedules for Air Pollution Sources
340/1-77-023 PB-275436	Major Financial Assistance Programs for Air Pollution Control Equipment Installation (Federal and EPA Region III State Programs)
340/1-83-018a PB4-127950	Initial Design Considerations for a Model State and Local Administrative Fines Program - Volumes I
340/1-83-018b	Initial Design Considerations for a Model State and Local Administrative Fines Program - Volume 2
340/1-83-021 PB-128339/A09	Development of Pilot Inspection System for Virginia Air Pollution Control Board

NEW TECHNICAL REPORTS AND MANUALS TO BE PUBLISHED IN FY 1986

Guidelines:

Inspection Guide for Capture Systems and Control Devices at Surface Coating Operations

Guideline for Graphic Arts VOC Emissions Calculations

Manual for Development of Special Operating Conditions for Asphalt Concrete Plants

Resource Manual on Continuous Emission Monitoring of Reduced Sulfur Compounds from Kraft Pulp Mills: Volume 1 - Technical Reference Manual, Volume 2 - Field Inspection Notebook

Fabric Filter Inspection and Evaluation

Use of Portable Instrumentation in VOC Compliance Inspections

Air Compliance Inspector Guide

Technical Reports:

Production Effects on BOF Secondary Emissions and Their Control

Coke Oven Control Status: Volume 2 - Stacks, Volume 3 - Coke Oven Gas Desulfurization

Effects of Process Variables on Sinter Plant Controls

Operation and Maintenance Practices to Minimize Excess Emissions from Cat Crackers

Operation and Maintenance Practices for Asphalt Concrete Plants

Compliance Workshop Training Manuals:

Instructor/Student Manual - Wet Scrubber Inspection Procedures Workshop

Instructor/Student Manual - Air Inspector Safety Procedures Workshop