United States
Environmental Protection
Agency

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

EPA-450/3-82-020b
August 1984

Air

EPA

Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels in Steel Plants—Background Information for Promulgated Standards

Final EIS

NSPS

EPA-450/3-82-020b

Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels In Steel Plants—Background Information for Promulgated Standards

Emission Standards and Engineering Division

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

August 1984

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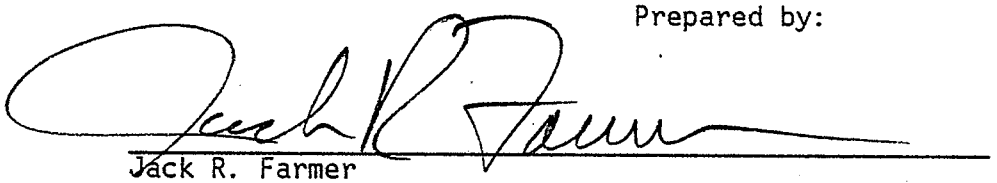
ENVIRONMENTAL PROTECTION AGENCY

Background Information
and Final
Environmental Impact Statement
for Electric Arc Furnaces and
Argon-Oxygen Decarburization Vessels in Steel Plants

Prepared by:



11/5/84
(Date)

Jack R. Farmer
Director, Emission Standards and Engineering Division
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1. The promulgated revised standards of performance continue to limit particulate matter emissions from an electric arc furnace and argon-oxygen decarburization vessels. The visible emission standard is less than 3 percent from a control device, less than 6 percent from the shop, and less than 10 percent from the dust-handling system. Section 111 of the Clean Air Act (42 U.S.C. 7411), as amended, directs the Administrator to establish standards of performance for any category of new stationary source of air pollution that " . . . causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare." Steel plants are located in all areas of the nation.

2. Copies of this document have been sent to the following Federal Departments: Labor, Health and Human Services, Defense, Transportation, Agriculture, Commerce, Interior, and Energy; the National Science Foundation; the Council on Environmental Quality; members of the State and Territorial Air Pollution Program Administrators; and Association of Local Air Pollution Control Officials; EPA Regional Administrators; and other interested parties.

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1. SUMMARY

On October 21, 1974 (39 FR 37466), standards of performance were proposed under Section 111 of the Clean Air Act to control particulate matter emissions from electric arc furnaces (EAF's) in the steel industry. Standards of performance were promulgated on September 23, 1975 (40 FR 43850), and apply to any facility constructed, modified, or reconstructed after October 21, 1974. Under the Clean Air Act amendments of 1977, standards of performance must be reviewed every 4 years and revised, if appropriate. On April 21, 1980, a notice was published in the Federal Register (45 FR 26910) announcing such a review of the standards of performance for EAF's in the steel industry. The review found that fugitive emissions capture technology had improved since promulgation of the existing standards of performance for EAF's. Another finding was that argon-oxygen decarburization (AOD) vessels are a significant source of particulate matter emissions in specialty steel shops. As a result of these findings, additional data were collected on the controlled emission levels from EAF's and AOD vessels to determine how the standards should be revised.

Revised standards of performance were proposed on August 17, 1983. The period for public comment extended through October 31, 1983, and seven written comments were received. A public hearing was requested by one individual, but this request was later withdrawn, and no public hearing was held. The comments on the proposed standards, together with responses to each comment, are presented in this document. The comments and responses serve as the basis for the revisions that have been made to the proposed standards.

1.1 SUMMARY OF CHANGES SINCE PROPOSAL

In response to public comments, certain changes have been made in the proposed standards, and the more significant changes are summarized below. All changes that have been made to the regulation are explained fully in the responses to the comments.

For sources built between October 21, 1974, and August 17, 1983, Section 272(a)(3)(iii), which was in the original regulation but was changed in the proposed revisions, is reinstated in the promulgated regulation. The related sections 274(a)(3), (a)(4), (b), (c), (e), and (f) of the original regulation are also reinstated. Sections 274(b) and (c) have been revised, and Section 274(e), (f), and (g) have been redesignated (f), (g), and (h). These sections require continuous monitoring of the flow rate through each capture hood and the pressure in the free space inside the furnace and require that the monitored flow rates and pressure be maintained at baseline levels established during the most recent performance or compliance test.

Modular, multiple-stack, negative-pressure baghouses have been included with positive-pressure baghouses as control devices that may be monitored by Reference Method 9 observations in lieu of transmissometers.

Sections 275(i) and 275a(c) have been revised to make it clear that, where it is possible to determine that visible emissions at multiple sites are attributable to only one incident of the visible emissions, one set of Reference Method 9 observations from the point of highest opacity that directly relates to the cause (or location) of the incident will be sufficient.

In addition, because of the Agency's continued standards development work, several other changes have been made in the standards. Both Subparts AA and AAa are revised to permit either periodic monitoring and recording of fan motor amperage and damper position or continuous monitoring and periodic recording of flow rates. In Subpart AA, if fan motor amperage/damper position monitoring is the chosen alternative, the monthly operational status inspections that were proposed will be required. Sections 275(a)(1) and 275a(a)(4) have been revised to make it clear that only Reference Method 5 is to be used on negative-pressure fabric

added to Subpart AA. This section requires that when the "baseline" monitored values are outside of acceptable ranges, these values must be reported semiannually. To be consistent with Subpart AA, Subpart AAa has been revised to require establishment of these same "baseline" values. Semiannual reporting of values outside of the specified ranges is also required for Subpart AAa. Both Subparts AA and AAa have had a provision added to clarify the requirements in Sections 275(g)(2) and 275a(h)(2) of acceptance by the Administrator. When utilizing a performance test method that compensates for the emissions from the facilities not subject to the provisions of the standards, the Administrator must be notified of the method to be used 30 days prior to the performance test and must approve the method.

1.2 SUMMARY OF IMPACTS OF PROMULGATED AMENDMENTS

1.2.1 Alternatives to the Promulgated Action

The regulatory alternatives are discussed in Chapter 6 of Volume I of the background information document (BID) for the revised standards (EPA-450/3-82-020a). These regulatory alternatives reflect the different levels of emission control that were analyzed in determining best demonstrated technology, considering costs, nonair quality health, environmental, and economic impacts for EAF's and AOD vessels in steel plants. These alternatives remain the same.

1.2.2 Environmental Impacts of the Promulgated Action

The environmental impacts resulting from the revised standards are described in Chapter 7 of Volume I of the BID. These impacts remain the same.

1.2.3 Energy and Economic Impacts of the Promulgated Action

Energy and economic impacts resulting from the standard are discussed in Chapters 7 and 9, respectively, of Volume I of the BID. No changes in these impacts have occurred since the standards were proposed.

1.2.4 Other Considerations

1.2.4.1 Irreversible and Irretrievable Commitment of Resources. The regulatory alternatives defined in Chapter 6 of Volume I of the BID would not preclude the development of future control options nor would they curtail any beneficial use of resources. The alternatives do not involve short-term environmental gains at the expense of long-term

environmental losses, and the alternatives yield successively greater short- and long-term environmental benefits. Further, none of the alternatives result in the irreversible and irretrievable commitment of resources. No change in these considerations has resulted since proposal of the standards.

1.2.4.2 Environmental and Energy Impacts of Delayed Standards. As discussed in Chapter 7 of Volume I of the BID, delay in the revised standards would cause a similar delay in realizing the beneficial impacts associated with the standard. No changes in the potential effects of delaying the standards have occurred since proposal of the revised standards.

1.2.4.3 Urban and Community Impacts. Urban and community impacts of the standards are considered under economic impacts in Chapter 9 of Volume I of the BID. No changes in these impacts have occurred since the standards were proposed.

2. SUMMARY OF PUBLIC COMMENTS

A list of commenters and their affiliations is presented in Table 2-1. Seven individuals representing two steel companies, two local government agencies, two trade associations, and one private citizen submitted written comments during the public comment period.

The comment letters often contained several comments. Each comment is addressed separately, and the commenter is identified by the appropriate docket number.

2.1 TEST METHODOLOGY

2.1.1 Mass Emissions

Comment: One commenter (IV-D-6) states that Reference Method 5D is the most practical test method under the circumstances.

Response: No response is necessary.

Comment: Commenter IV-D-4 considers Reference Method 5D to be unacceptable because the Environmental Protection Agency (EPA) has only shown that Method 5D yields results similar to those obtained by Method 5; however, the EPA has not shown that Reference Method 5D is accurate and precise. The commenter cites Portland Cement v. Ruckelshaus (486 F.2d 375) and Chrysler v. DOT (472 F.2d 659) for the requirement that the test method used should be objective, repeatable, and precise.

Another commenter (IV-D-7) also believes that the accuracy and precision of any proposed compliance sampling method should be demonstrated.

Response: Method 5D is an adaptation of Method 5 for the emission testing of positive-pressure fabric filters. The sample collection and analysis procedures specified in Method 5D are identical to those in Method 5, and, therefore, the Agency expects the precision of Method 5D

TABLE 2-1. LIST OF COMMENTERS FOR THE REVISION TO THE NSPS FOR EAF'S AND AOD VESSELS IN STEEL PLANTS[a]

No.	Commenter	Date of comment	Docket entry No.
1	Steel Bar Mills Assoc. (O. A. Dulle, Jr.)	9/2/83	IV-D-1
2	C F & I Steel Corp. (B. D. Egley)	10/14/83	IV-D-2
3	National Steel Corp. (J. G. Manda)	10/28/83	IV-D-3
4	American Iron and Steel Institute (E. F. Young, Jr.)	10/27/83	IV-D-4
5	Allegheny County (PA) Bureau of Air Pollution Control (R. J. Chleboski)	10/24/83	IV-D-5
6	Donald L. Shepherd	10/28/83	IV-D-6
7	Illinois Environmental Protection Agency (D. J. Goodwin)	10/28/83	IV-D-7

[a]Copies of all correspondence received from commenters appear in Docket A-79-33.

to be similar to that of Method 5. The absolute accuracy of a particulate emission sampling method is undeterminable, but the precision of Method 5 results have been demonstrated over many years of testing. Method 5D is discussed in greater detail on page 2-5.

The issues of Reference Method 5D repeatability, objectivity, and precision were resolved during development of the emission limit for this regulation. Method 5D was used as the field test method for acquiring the data for this regulation, and this method was applied to several different fabric filter configurations. (See BID, Vol. I, Appendix C for descriptions.) The precision of the results of these tests was considered in developing the emission limit for this standard.

Comment: Commenter IV-D-4 believes that Reference Methods 5 and 5D are less appropriate than high-volume sampling for the testing of positive-pressure fabric filters. This commenter states that the high-volume sampling method has been used predominantly to measure the emissions from EAF fabric filters. However, the EPA has proposed that Reference Method 5 or 5D should be used on positive-pressure fabric filters. The EPA supported this change by presenting the results from two tests using Reference Method 5D that show higher particulate matter concentrations than those obtained with the high-volume sampling method. The commenter states that the EPA has not clearly shown which of these methods is correct. The commenter believes that the high-volume sampling method is better suited to positive-pressure fabric filter exhaust conditions because it is designed to operate at low air velocities, and it collects more sample weight than is collected by Method 5D.

Two other commenters (IV-D-2 and IV-D-5) believe that high-volume sampling is an appropriate test methodology for testing positive-pressure fabric filters.

Commenter (IV-D-5) believes that, for pressurized fabric filters with gas flow rates under 100,000 acfm, high-volume sampling results in emission data that are about 20 percent lower than Method 5 sampling results. At a flow rate of 100,000 acfm or greater, direct testing of exhaust stacks becomes economical.

Response: The Agency proposed Method 5D instead of high-volume methods for sampling of positive-pressure fabric filters for two reasons.

First, the Agency conducted simultaneous comparison tests using both Method 5 equipment and high-volume samplers. The data obtained from these tests show that the high-volume particulate concentration results were 70 to 85 percent lower than those indicated by the Method 5 equipment on emissions from a positive-pressure fabric filter. Results of other comparisons between the two methods, both direct and indirect, also show that high-volume sampling methods produce results lower than Method 5 or Method 5D (docket entry IV-A-1).

A subsequent conversation with Commenter IV-D-5, discussing a 20 percent difference between high-volume sampling and Method 5, disclosed that this was a subjective estimate and was not based on any direct comparisons (docket entry IV-E-4).

Second, as is discussed further on page 2-5, the Agency has determined that it is necessary to use demonstrably reliable equipment and multipoint sampling to assure a representative collection of particulate emissions from most emission sources, including fabric filters. Method 5D incorporates the multipoint sampling requirements with the use of reliable Method 5 equipment to provide a practical method for testing positive-pressure fabric filters.

Comment: One commenter (IV-D-2) states that the diagrams presented on pages 37356 and 37357 of the Federal Register proposal notice are oversimplified and not typical of the fabric filter at the commenter's facility, which has 32-compartments and does not have a ridge vent roof.

The commenter suggests using high-volume sampling as an alternative to Reference Method 5D, thus reducing the number of sampling stations (in the case of his fabric filter, from 32 to 2). The commenter believes that the costs of performance testing would range from about $10,000 to $24,000, for a Reference Method 5 series of three test runs. He states that high-volume sampling would cost $5,000 to $8,000.

Another commenter (IV-D-4) expresses concern that Reference Method 5D could be used by enforcement personnel for any roof monitor exhaust for which other test methods have not been specified, i.e., shop roof exhausts. Therefore, the commenter recommends the high-volume sampling method; alternatively, Reference Method 5D should be forbidden under 40 CFR 52.12(c)(1) for State implementation plan (SIP) enforcement.

Response: As noted in the preamble to the proposed revisions (48 FR 37348-9), because the General Provisions (40 CFR 60.8[e]) require that all control devices be testable, some States have been requiring affected facilities controlled with positive-pressure fabric filters to undertake the expensive retrofit of stacks or stack extensions onto the fabric filter for testing purposes. This situation was brought to the Agency's attention during development of this revised NSPS. Reference Method 5D was developed in response to this situation to ensure the availability of uniform test procedures for positive-pressure fabric filters.

Method 5D was proposed because the Agency recognized the complications involved in testing the many different configurations of positive-pressure fabric filters. The procedure section of Method 5D addresses most of the sampling issues for these tests including examples of the application of the method to multicompartment fabric filters. The requirement for multipoint sampling for particulate concentration is necessary to achieve representative results because of the possibility of stratification of the gas stream occurring within a positive-pressure fabric filter. This stratification is caused by incomplete mixing of the gas in the fabric filter and results in varying particulate concentrations across the exhaust gas profile of the fabric filter. Method 5D represents a reasonable balance between the multipoint sampling requirements necessary to achieve representative results and a recognition of the practical problems of testing the many different outlet configurations found on positive-pressure fabric filters.

Method 5D is a procedure based on the EPA Reference Method 5 to accommodate testing of emission sites that do not conform to conventional exhaust configurations and is appropriate for testing positive-pressure fabric filters. The commenter presumes that application of the high-volume method would reduce the number of sampling locations required for a test and concludes that the costs of testing would be greatly reduced with the use of high-volume methods. The Agency has determined that there is a need for multipoint sampling and for testing a representative number of sampling locations. Use of high-volume sampling equipment would not preclude these requirements. Applying the multipoint sampling

requirements of Method 5D to high-volume sampling may actually be more expensive than testing with Method 5 equipment under the same requirements. A greater number of samples might have to be analyzed because more than one filter catch might be necessary for each sample location when using a high-volume sampling train. Additional equipment, such as a greater number of high-volume samplers and volume measurement devices, might also be necessary.

The commenter (IV-D-2) who cites the example of a 32-compartment fabric filter with two end-vents apparently assumes that such a fabric filter would require 32 sample locations using Method 5D. Section 4.2.3 of Method 5 or 5D indicates that, if all 32 compartments are potential measurement sites (i.e., no roof monitor or stack exists), 12 compartments or 50 percent of the total number of compartments, whichever is greater, must be tested. For the commenter's example, a maximum of 16 sites, not 32, need to be tested following Method 5D. However, six measurement sites would need to be sampled per test run, in keeping with the requirement that the same number of sites be sampled for each test run. It should be noted that, if the two end-vents comply with the stack configuration requirements in Method 5D; the number of test sites could be reduced from 16 to 2.

The basis of the commenter's estimated costs of a performance test are not explained, and those costs presented in the proposal's preamble are believed to be correct. The costs to conduct a performance test according to Reference Method 5D are explained in detail in Appendix D of Volume I of the BID. These costs are based on the assumption that a test may require between 4 to 8 person-days of field work. The costs of $5,000 to $8,000 include the test report.

The applicability of Reference Method 5D was explained at proposal. Uses of Method 5D other than on the exhaust of the positive-pressure fabric filter were not endorsed and no data exist to support use of the Method on other sources.

Comment. A commenter (IV-D-2) states that determining a velocity profile, as required by Reference Method 2, for even a small fabric filter such as the five-compartment fabric filter depicted in the proposal

preamble, would be difficult because of the large area over the filter compartments.

Another commenter (IV-D-7) believes that Reference Method 2 yields inaccurate measurements of the gas stream when gas velocities are very low.

Response: Commenter IV-D-7 is correct about measurements of velocities outside the range recommended by Method 2. Section 4.3 of Method 5D includes a provision for measuring inlet gas flow rates and calculating average outlet gas velocities (using the known outlet area) for use in isokinetic determinations for those sources whose outlet velocities cannot be accurately measured using Method 2. It is the Agency's intent that velocity measurements be conducted at each outlet sampling point if the velocity head exceeds 0.05 inch of water column (in. w.c.). However, the inlet sampling option is a reasonable alternative when lower velocity conditions exist. Other approaches to measuring outlet gas velocity, such as micromanometers or special low velocity Pitot tubes, may also be applied subject to advance approval by the Administrator, as described at 40 CFR 60.8(b).

Comment: One commenter (IV-D-5) believes that there could be problems calculating the gas velocity required for Reference Method 5D sampling because leakage could occur between the inlet and outlet of the fabric filter. The commenter states that using the average gas velocity at the inlet, corrected to outlet conditions as specified in Method 5D, is not as accurate as using velocity measurements at each outlet site.

Another commenter (IV-D-7) questions whether it is appropriate to accept inlet flow rate measurements to determine total volumetric flow.

Commenter IV-D-2 states that Reference Method 5D is not appropriate for emission testing of positive-pressure fabric filters because of possible ambient air infiltration into the fabric filter and the high costs of sampling each compartment. As an example of problems of ambient air infiltration, the commenter describes a basic oxygen furnace secondary emission fabric filter at his facility where the entry level at the filter floor is open to the atmosphere. The commenter states that, as a result, significant dilution of the exhaust stream occurs at either the top of the bags or at the exhaust portal. On the other hand, the commenter

also describes an EAF fabric filter with man-sized doors near the ports where a "flue" type duct situation near the doors is unlikely to occur.

Response: There is no technical difficulty in using a flow balance approach to determine fabric filter outlet air velocity, provided that leaks of air into and out of the fabric filter structure are identified and sealed. The Agency addresses the issue of air leakage into or out of the fabric filter with the note in Section 4.3 of Method 5D. This note states: "All sources of gas leakage into or out of the fabric filter housing between the inlet measurement site and the outlet measurement site must be blocked and made leak-tight." This requirement would apply when measurements at the inlet to the fabric filter are used to calculate average gas velocity for isokinetic determinations and when sources of ambient air in-leakage or emission leakage exist in the housing.

In using the words "leak-tight," it is the EPA's intent that major air leakage sites, such as open grate floors and large access doors be sealed adequately with relatively inexpensive plastic or fiberglass materials. This procedure for preventing air in-leakage has been demonstrated during the data collection process for this regulation. The positive-pressure characteristic of the fabric filters used in this industry aids in identifying the location of most small air leaks. Those leaks that can be located should be sealed prior to, and for the duration of, the test period.

In promulgating Method 5D, the note in Section 4.3 has been moved to the test procedures section to give it more visibility. Also, the note has been revised to state that the steps to block the leakages should be taken prior to the emission measurements.

Comment: One commenter (IV-D-2) states that probe supports would be required at each sampling port because of the probe length required to span even the smallest fabric filter module.

Another commenter (IV-D-7) also believes that problems of probe supports or probe rigidity should be considered in the test method.

Response: Rather than specify solutions in Method 5D to each testing problem that might arise, site specific testing problems are usually left to testing and shop personnel to resolve. There are a

number of approaches to sampling over long traverses; for example, diametrically opposed sampling ports will reduce probe length by half, internally mounted cables or bars for probe supports will eliminate need for external structures, and sampling from a roof monitor or vent location will greatly reduce the traverse lengths. Probe length requirements did not pose problems in using Method 5D to acquire the data necessary to establish the NSPS for EAF's and AOD vessels in steel plants.

Comment: One commenter (IV-D-5) states that it is not necessary for the test method to require both a volume of 160 dry standard cubic feet (dscf) and a sample weight of 50 milligrams (mg). The commenter points out that emissions from some sources are so low that it could become necessary to test for up to 8 hours to collect a 50 mg sample. The commenter believes this amount of time is unreasonable, especially for a clean source. The commenter believes that the minimum sample volume of 160 dscf is adequate and recommends that the minimum sample weight of 50 mg be deleted.

Response: The Agency agrees with this comment. Proposed paragraph 60.275 of Subpart AA reflects this decision, but proposed paragraph 60.275a of Subpart AAa mistakenly included the 50 mg minimum catch requirement. This has been corrected in the final rulemaking by amending paragraph 60.275a to delete the 50 mg requirement.

Comment: Commenter IV-D-7 questions whether isokinetic sampling of the exhaust gas stream from a fabric filter is necessary if particulate matter emissions are in the submicron range.

Response: Particle size distribution tests on fabric filter exhausts have shown that the mass median diameter of the outlet particles is somewhat smaller than that of the inlet particles, but it is not necessarily a submicron particle size. For emissions from EAF operations, it is expected that the change in mass median diameter from inlet to outlet would be very slight. Therefore, unless the inlet particle size distribution is submicron, which is an unlikely occurrence for EAF and AOD vessel emissions, the outlet particle size distribution will probably not be skewed toward the submicron range. Isokinetic sampling must be maintained to assure a representative collection of particles greater than 2 microns.

Comment: Commenter IV-D-7 questions whether the sampling probe is heated and asks how to accomplish such heating, if necessary.

Response: Method 5D specifies sampling at or above the stack temperature up to a nominal 248°F. If Method 17 equipment is used, no filter or probe heating is required. Heating of the probe and filter for Method 5 equipment is as specified in Method 5. Heating techniques are outlined in Method 5 reference material and include rheostat- or thermostat-controlled nichrome wire for glass-lined probes and insulated heating wire for metal probes.

Comment: Commenter IV-D-7 questions whether stack testing apparatus can operate properly for the duration of a test, which is up to 4 hours.

Response: Properly designed and constructed Method 5 sampling equipment will endure test periods much longer than 4 hours. The parts (usually industrial grade) that constitute the sampling train are commonly available and, with normal operation and care, should operate satisfactorily for indefinite periods. The sampling periods for tests in support of this regulation often exceeded 8 hours with few or no equipment problems.

Comment: Commenter IV-D-7 believes that design standards for positive-pressure fabric filters should be considered in lieu of emission testing requirements.

Response: Sections 111(h)(1) and (2) of the Clean Air Act require that emission limits be established if it is "feasible to prescribe or enforce a standard of performance." This phrase 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" (Section 111[h][2]). For this industry, feasible control technology and test methods exist, and, thus, design standards are not permitted in lieu of emission limits.

Moreover, in most cases, it would not be possible to evaluate design parameters alone to predict compliance with the emission limit. This is because there are operational parameters, such as the timing and duration of cleaning cycles or compartment air flow distribution, that can affect fabric filter performance.

Method 5D was proposed as a practical emission testing method. It is appropriate for measuring the emission levels from positive-pressure fabric filters, and the costs of testing are reasonable.

2.1.2 Visible Emissions

Comment: One commenter (IV-D-4) endorses the use of Reference Method 9 as an alternative to transmissometers for continuous monitoring of positive-pressure fabric filters. At the same time, the commenter believes that continuous monitors should not be required on modular, negative-pressure fabric filters that have multiple stacks. Such fabric filters would require multiple monitors, which would significantly increase the capital and operating costs. Therefore, the commenter recommends that Reference Method 9 be allowed on both modular, negative-pressure fabric filters and positive-pressure fabric filters as an alternate method of continuous monitoring.

Response: Two fabric filter vendors were contacted (docket entries IV-E-1 and IV-E-2) for information about current installations and trends in the use of modular, multiple-stack, negative-pressure fabric filters. The vendors confirmed the EPA information that the industry trend is toward positive-pressure fabric filters.

The commenter, a representative of a trade association, was also contacted (docket entry IV-E-3), and he explained that a staff member's concern about possible future use of modular, multiple-stack, negative-pressure fabric filters prompted the comment. The commenter was not aware of any installations of such fabric filters or of plans for their use in the future.

Although it is unlikely that modular, multiple-stack, negative-pressure fabric filters will be used extensively by the industry, the Agency is aware of three such fabric filters in use to control emissions from EAF's. Therefore, it is appropriate to permit Reference Method 9 visible emission observations by a certified observer in lieu of a transmissometer

to monitor visible emissions from such units, and Sections 273(c), 275(i), 273a(c), and 275a(c) of the regulations have been changed to reflect this position.

Comment: One commenter (IV-D-5) supports the use of Reference Method 9 visible emission observations as an alternative to transmissometers. However, the commenter does not believe that these observations are necessary 5 days per week. The commenter recommends making the observations every third operating day because he believes that this frequency is sufficient to ensure proper operation and maintenance of positive-pressure fabric filters.

Response: The decision to permit Reference Method 9 visible emission observations to monitor opacity from positive-pressure fabric filters and modular, negative-pressure fabric filters with multiple stacks was made because studies indicate that there are difficulties associated with the use of one transmissometer to monitor multiple stacks or very long path lengths (docket entry II-I-86). The capital and operating costs for installing multiple transmissometers, which may be necessary in some cases, are considered to be unreasonable. However, the Agency continues to believe that, in general, continuous monitoring of visible emissions from control device stacks provides the best indication of the status of operation and maintenance of the control device. The requirement to observe visible emissions 5 days per week is based on our engineering judgment that at least daily observations are necessary to detect bag failure and to prevent associated excess emissions. In view of these considerations, requiring Reference Method 9 visible emission observations once per day of operation for 5 days per week is reasonable and appropriate.

Comment: One commenter (IV-D-4) states that the regulations allow the use of Reference Method 9 in lieu of transmissometers for continuous monitoring of positive-pressure fabric filters. However, the preamble (in two places) appears to allow no choice between visual opacity monitoring by Reference Method 9 and continuous monitoring by a transmissometer on positive-pressure fabric filters. Therefore, the commenter

recommends that the preamble be corrected to reflect the regulation, which is the appropriate position.

Response: The commenter is correct; there is an inconsistency between the proposal preamble and the regulation. The promulgation preamble will explain that, for positive-pressure and modular, multiple-stack, negative-pressure fabric filters, it is permissible to have a certified visible emissions observer monitor the opacity of visible emissions in lieu of installing a transmissometer. Reference Method 9 visible emission observations must be used to monitor the emissions from these units if a transmissometer is not installed.

Comment: One commenter (IV-D-4) states that the EPA has not evaluated the accuracy or precision of Method 9 for monitoring visible emissions from area sources such as shop roof monitors. The commenter states that it is essential for the EPA to establish the accuracy and precision of Method 9 for this type of source because (1) the method stipulates that the accuracy of the method must be taken into account when determining compliance; (2) the method provides information regarding its accuracy and precision only for sources of continuous emissions being discharged through a stack; and (3) many variables exist which affect the accuracy and precision of EAF shop roof monitor opacity readings, and these variables were not evaluated adequately when the EPA developed and adopted Method 9. Some of the variables that must be evaluated include roof monitor size and geometry, air flow and velocity, orientation with respect to the sun, various meteorological factors, fluctuations in the appearance of emissions, and scheduling of activities in the shop. Therefore, the commenter recommends that the EPA include an alternative mass emission limitation in the regulation for process fugitives as an option available in the event that the opacity limit cannot be met.

The commenter notes that there is a published method for measuring shop roof mass emissions: D. Trozzo and J. Turnage, "Method for Determining Mass Particulate Emissions from Roof Monitors," Journal of the Air Pollution Control Association, October 1981, Volume 31, Number 10.

Response: The "EPA Response to Remand Ordered by U.S. Court of Appeals for the District of Columbia in Portland Cement Association v. Ruckelshaus (486 F.2d 375, June 29, 1973)", discusses in detail the reliability and accuracy of Reference Method 9 and accompanying certification techniques for determining compliance with visible emission standards. On the basis of this response, the visible emission standard included in the NSPS for portland cement plants was affirmed by the Court on appeal in Portland Cement Association v. Train, 513 F.2d 506. The data gathered in responding to the remand for portland cement plants convincingly demonstrate that individual visible emission observers can, for single runs, read the opacity of visible emissions within an acceptable level of precision. The accuracy of the Method is taken into account in the enforcement process, as provided explicitly by Reference Method 9.

Reference Method 9 is applicable ". . . for the determination of the opacity of [visible] emissions from stationary sources pursuant to Section 60.11(b) . . . " (40 CFR 60 Appendix A, Method 9). As stated in the method: "Many stationary sources discharge visible emissions into the atmosphere; these emissions are usually in the shape of a plume. This method involves the determination of plume opacity by qualified observers." The major factors influencing plume opacity are: particle characteristics (particle size distribution, particle density, refractive index), particulate concentration, the background against which the emissions are viewed, the observer's position relative to the sun, and the light path length through the emission plume. Particle characteristics and particulate concentration are determined by the process operation and the emission control technology.

In the steel industry, plumes are released at elevated points such as roof monitors. As a result, the background for reading the opacity of visible emissions is the same for both types of sources, generally consisting of sky, horizon, or other structures. Furthermore, Method 9 indicates how various meteorological conditions are to be taken into account. Thus, the ability to read the opacity of visible emissions from roof monitors is not influenced by background anymore than is the ability to read visible emissons from stacks.

The geometry of stacks and roof monitors do differ. Stacks are generally circular, and as a result, the path length through the plume is essentially the same in all directions. Roof monitors tend to be rectangular with a long and short dimension. The light path length through the plume, therefore, is different depending on whether the observer sights along the long dimension or the short dimension. When the opacity of visible emissions from roof monitors is read, Reference Method 9 specifically requires that observations be taken approximately perpendicular to the long dimension of the roof monitor (i.e., across the short dimension), which ensures that observed opacity is minimized. When the visible emission standards for this industry were developed, visible emission observations were taken from existing furnace shops with typical roof monitor designs. Thus, the effect of path length on opacity is taken into account during development of the standards, and Reference Method 9 ensures that compliance with the standards is determined by reading plumes across the shorter path length.

The ability to read the opacity of visible emissions, therefore, does not depend on whether these emissions are released from stacks or roof monitors. Reference Method 9 is applicable to plumes from stacks, roof monitors, and other points of release.

The test program for each specific source type is designed to account for the variables that affect the visible emissions of that specific source. In the test program for the NSPS that applies to EAF's and AOD vessels in steel plants, the tests covered the entire heat cycle, thus accounting for fluctuations in the appearance of emissions and the scheduling of relevant activities in the shop. In addition, the various facilities tested covered the range of roof monitor sizes and configurations and of air flows and velocities that are expected in the industry (see BID, Vol. 1, Appendix C.).

The use of visible emission standards is technically sound and provides the most practical and inexpensive means to ensure that affected facilities are properly maintained and operated. The opacity of visible emissions exiting the shop roof monitor is a good indicator of the performance of the process and fugitive emissions capture systems.

Therefore, shop roof monitor visible emission opacity limits were selected as the format for this standard. Practical methodology does not exist to obtain measurements of mass emissions discharged from shop roof monitors. The shop roof mass emission testing procedures suggested by the commenter would be more expensive than Reference Method 9 observations and, in some cases (where there is not only low exit velocity but possibly negative pressure and fluctuating mass concentrations), would be highly inaccurate and unreliable. In addition, this shop roof mass emission measurement technique has not yet been adequately tested and evaluated. Therefore, a mass emission limit for fugitive emissions from the shop roof would not be consistent with the requirements of the Clean Air Act.

Comment: One commenter (IV-D-2) states that it is not practical to use Reference Method 9 observations to monitor fugitive emissions from the dust handling equipment because of the difficulty of determining at what point in the emission plume the opacity should be read. The commenter suggests that it would be more appropriate to require proper operation of the dust handling equipment, which could include routine operational status inspections.

Response: Reference Method 9, Section 2.3, specifies that opacity observations must be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. The plumes that result from fugitive emissions from the dust-handling equipment associated with EAF's in the steel industry would not be expected to contain condensed water vapor because the temperatures of such plumes are typically about 120° to 130°F. Thus, there should be no difficulty in determining at what point in the visible fugitive emission plume the opacity should be read because a certified observer only needs to look for the point of greatest opacity.

Comment: One commenter (IV-D-2) states that, in some cases, it could be necessary to perform three Reference Method 9 opacity observations at each site of visible emissions from a fabric filter to comply with 40 CFR 60.275a(c). The commenter cites his equipment as an example: a positive-pressure fabric filter with 32 compartments, each of which is discharged into a common outlet plenum that is open to the atmosphere at

each end of the fabric filter. In addition, a horizontal slot is located on the front, bottom side of each compartment. Thus, visible emissions resulting from a broken bag in any one compartment could be seen at three locations. The commenter concludes that Section 275a(c) would require 54 minutes of Reference Method 9 observations for the one incident.

Response: It is not the Agency's intent to create unnecessary work for owners or operators of affected facilities. Thus, Sections 275(i) and 275a(c) have been revised to make it clear that, where it is possible to determine that visible emissions at multiple sites are attributable to only one incident of the visible emissions, one set of Reference Method 9 observations from the point of highest opacity that directly relates to the cause (or location) of the incident will be sufficient.

2.2 EMISSION LIMITS

2.2.1 Mass Emission Standard

Comment: One commenter (IV-D-5) states that, in his experience, well-designed and -maintained positive-pressure fabric filters can control emissions far below 0.0052 gr/dscf; however, at this time, the commenter does not recommend a more stringent standard.

Another commenter (IV-D-6) believes that it is the EPA's policy to base NSPS emission limits on the worst performance of any of the sources selected for testing without regard to the condition of that worst source and any other mitigating factors. The commenter further believes that this policy rewards sources demonstrating a poor performance record. The commenter recommends that the Agency establish standards that encourage development of control strategies that reduce emissions as much as possible. The commenter notes that Figure 4-8 of the BID illustrates that only one fabric filter test on an EAF exceeded 0.0030 gr/dscf, and he concludes that this emission level represents the "degree of emission limitation . . . achievable through application of the best technological system of continuous emission reduction . . ." as required by the Clean Air Act. The commenter states that lowering the mass emission standard for EAF's and AOD vessels in steel plants from 0.0052 to 0.0030 gr/dscf would reduce particulate matter emissions by

about 35 percent; therefore, the commenter recommends a mass emission standard of 0.0030 gr/dscf for these sources.

Response: In establishing NSPS emission limits, the condition of sources selected for testing is not disregarded, as commenter IV-D-6 suggests. Rather, sources that are believed to be representative of modern practice in one or more segments of the industry to be regulated are selected for emission testing. Moreover, the operational status of the source is documented and monitored continuously during testing to ensure that the test data reflect an emission control level representative of best demonstrated control technology (BDT). Standards are set so that well-designed, -operated, and -maintained plants, using BDT, can achieve the standards over the range of conditions likely to recur in the industry.

In general, the data available on well-designed and well-operated EAF fabric filters do indicate that such fabric filters can perform to reduce emissions below 0.0052 gr/dscf. In fact, except for one test run at one facility, the data collected during the revision of this standard demonstrated that fabric filters on EAF's can achieve an emission level of less than 0.0031 gr/dscf. However, the Agency agrees with the recommendations made by Commenter IV-D-5 that the mass standard should not be lowered. This is because it was determined that, to guarantee fabric filter compliance with a 0.0031 gr/dscf standard, vendors might increase capital costs of fabric filters as much as 25 percent (docket nos. II-E-56, II-E-57, II-E-58, II-E-60). This increase in costs would result from the increased air-to-cloth ratio and other design factors needed to assure continuous compliance with the more stringent emission limit. Thus, the incremental cost effectiveness of the more stringent standard could be as much as $8,000/ton, which is considered to be unreasonable.

According to the Clean Air Act amendments of 1977, Section 111(a)(1), "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." The 0.0052 gr/dscf limit is based on the data available from well-controlled and -operated facilities, and it takes into account the costs of complying with the standards.

2.2.2 Visible Emission Standard

Comment: One commenter (IV-D-7) states that the proposal preamble explains neither the increase from 0 to 6 percent opacity in the visible emission limit for the roof monitor, nor the economic, energy, or environmental impacts associated with this increase. The commenter believes that, because the original standard allowed up to 20 percent opacity during charging and up to 40 percent opacity during tapping, this standard effectively applied only during melting. He concludes that the rationale for establishing an overall 6 percent visible emission limit presented in the proposal preamble is not applicable. The commenter draws this conclusion because the maximum opacity varies from 0 to 5 percent, although the average opacity from the tested plants only varies from 0 to 0.2 percent. The commenter notes that available control technology can achieve 3.3 percent opacity as an upper limit. The commenter recognizes the practical difficulties in implementing the 0 percent visible emission standard, and he recommends that the standard be set at 4 percent opacity and an exception be developed to address any infrequent exceedance. Furthermore, he believes that Section 60.11(c) of the General Provisions already accommodates those exceedances resulting from start-ups, shut-downs, or malfunctions. The commenter states that he supports a simple regulation that provides a single emission limit, and he suggests that it might be appropriate to consider different visible emission limits for carbon steel EAF, specialty steel EAF and AOD vessels.

Another commenter (IV-D-6) notes that Table 4-5 of the BID demonstrates that, except for one mill melting dirty scrap, all tested plants could comply with a 5 percent visible emission limit on all operations. Thus, the commenter concludes that a 5 percent visible emission limit for all operations is achievable and required by the Clean Air Act.

Response: We agree with commenter IV-D-7 that a simple regulation with a single emission limit is appropriate for this industry. By

setting the level of the standard to include all the data acquired during entire heat cycles, provisions for exceedances are not necessary. As was explained in the proposal preamble (48 FR 37347), the visible emission limits were selected based on the performance of the capture and control technologies that served as the basis for Regulatory Alternative B. The economic, energy, and environmental impacts associated with the revised standard were presented in the proposal preamble.

Although the impacts associated with Regulatory Alternative C are considered reasonable, this alternative was not considered suitable as the basis for national standards of performance because it is based on a closed roof configuration which may aggravate worker and equipment heat stress problems. Operating experience with this roof configuration is limited in areas of the country where ambient temperatures and humidity are high. Because the effects of heat stress cannot be fully evaluated at this time, Regulatory Alternative B was selected as the basis for the proposed revised standards.

Twenty-seven hours of opacity observations were made of shop roof visible emissions at two shops that utilized the capture systems upon which Regulatory Alternative B is based. These observations show that the maximum opacity of shop roof visible emissions is 5 percent. Visible emission limits for NSPS are based on achieved levels at well-operated and -maintained facilities that have installed what is considered to be the best demonstrated control technology. Visible emission limits are not based on opacity values averaged for the period of the test (see Portland Cement v. Train, supra). Thus, the visible emission level for this industry was set at 6 percent, which includes the highest Reference Method 9 observation plus a reasonable margin of safety. This methodology was approved by the Court in Portland Cement v. Train, supra. Under Regulatory Alternative B, exceptions for exceedances are unnecessary because the maximum opacity recorded was 5 percent throughout the heat cycle. As the commenter notes, 40 CFR 60.11(c) provides an exception for nonnormal operation. It is not appropriate to develop separate visible emission limits for carbon steel and specialty steel shops because the EAF's in both types of shops are operated and emit particulate matter in a similar manner, and, also, it is possible that the EAF will be operated alone from time to time in the specialty shop.

The plant that commenter IV-D-6 refers to appears to be Plant H. This plant was among those plants tested in developing the original standards. Control technology for EAF's, particularly for their fugitive emissions, has improved since the original test program. Thus, this plant was not used as a basis for the revised standards. For the reasons enumerated above, we believe that 6 percent opacity rather than 5 percent is the appropriate level for the visible emission standard for this industry. The Clean Air Act requires that the standard be achievable and representative of the best demonstrated control technology, taking into consideration other factors such as reasonable cost. The Court decision in National Lime Association v. EPA (627 F.2d 416 [1980]) requires that the standard must be achievable under all conditions expected to recur, and, in this industry, this includes the use of dirty scrap.

Comment: One commenter (IV-D-4) states that the EPA has not adequately documented that EAF and AOD vessel facilities subject to the NSPS will be able to comply with the 6 percent visible emission limit from shop roofs during charging and tapping (processes likely to cause the greatest fugitive emissions). The commenter states that only two out of seven plants tested were representative of the recommended emission capture system that is the basis for the standard (closed roof over the furnace and open elsewhere); four plants have totally closed roofs (representative of a more effective capture system); and one plant has a completely open roof monitor (representative of a less effective capture system). Forty-five 6-minute opacity readings were taken during charging and 24 6-minute readings were taken during tapping at the two plants that were representative. This means that the standard is based on less than 7 hours of relevant observations. The commenter believes that the number of observations made on shops with a closed roof over the furnace is limited, and, therefore, these data should not be used as a basis for the regulatory limit. The commenter cites National Lime Association v. EPA, supra, as an example of a case in which the EPA failed to establish the representativeness of the tested plants and the achievability of the standard under adverse conditions. The commenter recommends that exceptions to the opacity limits be allowed during charging and tapping as

are allowed in the original NSPS or that the preamble and regulation address emission problems that occur because of equipment malfunctions. Furthermore, the commenter recommends that any source meeting the EPA's suggested equipment requirement but failing the opacity standard be allowed to demonstrate compliance based on alternate mass emission limitations.

The commenter also questions the validity of the correlation between the shop roof opacity and mass emission rates. Because these estimated mass emission rates were used to determine the ambient air quality impacts, the commenter doubts the accuracy of the air quality impacts upon which the need for the proposed regulatory limit is based.

The commenter notes that Section 60.11(e) of the General Provisions allows a source to exceed the visible emissions standard if the mass standard is being met.

Response: The commenter is correct that the data base for the control configuration recommended for the NSPS contains tests at two facilities (Plants J and N) that "are representative of the suggested technology (closed roof monitors over furnace only)" [Regulatory Alternative B]. The commenter also points out that approximately 7 hours of Reference Method 9 observations were made for the charging and tapping portions of the heat cycle. The total data base includes 27 hours of Reference Method 9 observations during the course of entire heat cycles at plants representative of the recommended technology. This amount of visible emission data acquired at representative plants is, in the EPA's judgment, an adequate data base upon which to set a standard. National Lime Association v. EPA, which the commenter cites, does require that the data be from representative facilities and that the standard be achievable. However, the Court did not specify any quantity of data that must be acquired before a standard can be set, and the Agency believes that the data are sufficient to demonstrate the achievability of the standard because worst-case conditions for this industry were included in the test program. The questions of achievability of the standard and limited data were raised by the American Iron and Steel Institute at the National Air Pollution Control Techniques Advisory Committee meeting in July 1982, prior to proposal of the revised standards. In response to

these concerns, Plant N was visited and tested. Even during furnace upset conditions, when the fugitive emission capture system was receiving furnace emissions at a rate estimated to be almost 10 times higher than it would during normal furnace operation, Plant N achieved the standard. The maximum 6-minute average visible emission reading over a 2-day period that covered many entire heat cycles was 3.3 percent. All of the data for Alternative B demonstrate that the visible emission limit of 6 percent is achievable.

As noted in the proposal preamble (48 FR 37346), although most of the shops in the industry are closed roof or are changing to closed roof, and new sources are expected to be located in closed roof shops, Alternative B was recommended because the effects of heat stress on workers and equipment in closed roof shops in some areas of the country were unknown. The Agency did not want to risk causing any facility to incur problems with heat stress to achieve compliance with the standards. The commenter represents the major industry trade association, and this association's comments (II-D-67 and II-E-54) about possible heat stress problems in closed roof shops persuaded the Agency to conclude that the standard should allow the less stringent Regulatory Alternative B. As both the trade association and the Agency recognized, there were few partially open shops in existence, and, thus, only limited data could be acquired; however, these data are considered to be sufficient to set standards based on Regulatory Alternative B which is "worst case" in terms of emissions to the atmosphere.

Because the 27 hours of data acquired during charging, melting, and tapping demonstrate that the 6 percent visible emission limit can be achieved with best demonstrated control technology, the Agency no longer believes that exceptions to the standard are appropriate for the charging and tapping portions of the EAF heat cycle. In addition, it is not necessary to include an exception for equipment malfunctions in this standard because the General Provisions (40 CFR 60.11[c]) already provide relief for exceeding the standard during start-up, shutdown, and malfunctions.

Finally, Section 60.11(e) is not a provision that allows substitution of a mass emission standard for a visible emission standard.

Rather, Section 60.11(e) provides that owners or operators of any affected facility from any source category that meets the mass emission standard but does not meet the visible emission standard may apply for an individual visible emission standard tailored to the unique circumstances of their facility. This individual standard applies for the life of the affected facility and is automatically approved upon demonstration that: (1) the facility is in compliance with the mass emission standard; (2) the facility and associated air pollution control equipment were operated and maintained in a manner to minimize the opacity of emissions during the performance tests; (3) the performance tests were performed under the conditions established by the Administrator; and (4) the facility and associated air pollution control equipment were incapable of being adjusted or operated to meet the applicable opacity standard. For the reasons discussed in Section 2.1.2, page 2-14, a mass emission standard for fugitive emissions from shop roofs is not practical at this time. Therefore, Section 60.11(e) is not applicable to the shop roof standard.

As the commenter stated, the BID, Vol. I, page 6-16, states both that estimated fugitive emission reduction efficiencies were based on a review of the literature (e.g., II-A-8, II-I-68, and II-I-94), observation of furnace capture technologies at the facilities tested, and engineering judgment, and that this methodology is reasonable. The Agency did not, as the commenter concludes, attempt to correlate observed EAF shop roof opacities with mass emission rates. The visible emission standard and the mass emission standard are based on achieved emission rates. The estimated efficiencies were used to obtain estimated emissions reductions required to calculate cost effectiveness values of the various regulatory alternatives. Dispersion modeling was used to predict the contribution of emissions from EAF's and AOD vessels to the ambient particulate concentration. There was no attempt to establish any relationship between the opacity of visible emissions and ambient air concentrations.

Comment: One commenter (IV-D-4) states that the deletion of Section 272(a)(3)(iii) for sources built between October 21, 1974, and August 17, 1983, was not explained at proposal and is inappropriate.

This subsection required compliance with the shop roof opacity standard only when the flow rate through each capture hood and the pressure in the free space inside the furnace were being measured during a performance test. The flow rates and pressure established at this time became "baseline." At all other times, these operating conditions were required to be maintained at the baseline values or better. The commenter believes that the deletion of this paragraph results in the imposition of a new and more stringent emission limit on shops built to comply with the original NSPS because these shops will now have to meet the shop opacity standards during all routine EAF operations. The commenter believes that this is retroactive regulation of existing sources and exceeds the EPA's authority under Section 111 of the Clean Air Act. The commenter recommends reinstatement of the paragraph.

Response: The deletion of Section 272(a)(3)(iii) from the standards is not considered to be more stringent regulation and occurred because it was believed that not having to continuously monitor the flow rate and pressure would relieve some of the monitoring burden on owners or operators of affected facilities. Deletion of this section is less expensive for, and more convenient to, owners or operators; however, because of the concern expressed by the commenter, the regulation has been amended. Sources built between October 21, 1974, and August 17, 1983, will again be responsible for continuously monitoring, and maintaining at baseline values, the flow rate through each capture hood and the pressure in the free space inside the furnace. The shop roof visible emission standard will apply only during performance and compliance tests. Section 272(a)(3)(iii) and related Sections 274(a)(3), (a)(4), (b), (c), (e), and (f) of the original regulation will be reinstated. Sections 274(b) and (c) have been revised, and Sections 274(e), (f), and (g) have been redesignated (f), (g), and (h).

Comment: One commenter (IV-D-7) states that he generally agrees with the basis (improvements in fugitive emissions capture technology and increase in use of positive-pressure fabric filters) for the amendments (the shop roof visible emission standard and permitting Reference Method 9 observations in lieu of a transmissometer for

positive-pressure fabric filters) to the NSPS for EAF's in steel plants, and, thus supports the revisions to the standards.

Response: No response is necessary.

2.3 COSTS OF TESTING

Comment: One commenter (IV-D-2) states that compliance tests and procedures required by 40 CFR 60.275a(b) should not be required for facilities that exhibit no visible emissions (zero opacity). The commenter cites 48 FR 37344, Table 3, as evidence that the average concentration of the mass emissions is lower than the standard even when visible emissions exhibit opacities that are as high as 2.8 percent. Thus, the commenter believes that the expense of installing sampling ports and platforms should only be incurred if visible emissions are observed. The commenter states that sampling ports are just another source for leakage in a positive-pressure fabric filter and require additional maintenance.

Response: Visible emissions of zero opacity do not necessarily mean that the mass emission standard is being achieved by a control device because visible emissions do not relate directly to mass emissions but rather to mass concentration. This is one of the reasons that 40 CFR 60.8(a) of the General Provisions requires all new facilities to conduct performance test(s) and to furnish the Administrator a written report of the results of such performance test(s). Section 60.8(e) requires that the owner or operator of an affected facility provide testing facilities such as sampling ports, sampling platforms, safe access to platforms, and utilities for sampling equipment. Because these sampling requirements are necessary for any new facility required to comply with any standard, these requirements are not an additional burden to new EAF and AOD vessel facilities as a result of this NSPS. Sampling ports on the fabric filter inlet side can be sealed effectively against air leakage and ports on the outlet side cause no leakage problems because they are downstream of the bags. Sampling ports do not require significant maintenance.

Comment: One commenter (IV-D-2) states that monitoring fabric filters during a compliance test would be time consuming and expensive,

especially in the case of his 32-compartment fabric filter where each compartment would have to be checked for its sequence in the cleaning cycle, damper positions, broken bags, etc.

Response: As explained in Section 2.1.1, the maximum number of sampling sites would be 16 for this fabric filter. Acquiring information on control device conditions may be time consuming; however, this is part of any performance test and is essential in evaluating the test results. The Agency is aware of the time and expense involved in testing the fabric filter, and, therefore, every attempt was made to simplify testing procedures for a multi-compartment fabric filter. The costs of testing were included in the economic analyses of the standard.

Comment: One commenter (IV-D-3) states that the test log required by 40 CFR 60 Sections 275(c) and 275a(d), Item 23, repeats all of the information required by Items 1 through 22 in these sections and, thus, is unnecessary. Furthermore, the commenter believes that maintaining the log during testing could require the use of an additional person, thereby increasing the cost of testing.

Response: There is sufficient information to evaluate the testing procedure and accuracy in Items 1 through 22 to be included in the test reports required under Sections 60.275 (c) and 60.275a(d). Therefore, item 23 (test log) is not necessary and has been deleted. Item 7 has also been changed to include test times, as well as test dates.

2.4 MISCELLANEOUS

Comment: One commenter (IV-D-4) states that the requirement to monitor the pressure in the free space within the EAF is unnecessary. The commenter states that the quality of steel produced is dependent upon furnace pressure, and the commenter does not believe that the EPA has authority to require monitoring of operating parameters that do not relate directly to control devices. The commenter believes that it is the owner or operator's obligation to control emissions to the EPA-specified limits and that he should be allowed to choose how to adjust process operations to achieve this objective. Therefore, the commenter recommends that the EPA delete the requirement that EAF free space pressure be monitored/recorded.

The commenter also questions what improvement in air quality can be expected as a result of other monitoring requirements, such as those stated in Section 60.274a(c) that requires the owner or operator to perform monthly operational inspections of capture equipment and record the deficiencies noted. The commenter believes that the owner or operator should be allowed to determine the frequency and type of inspection and maintenance program that is most efficient for his operation.

Response: Electric arc furnace facilities use pressure monitors inside the furnace to measure the pressure in the free space because this pressure is a critical parameter in steel production and, thus, is routinely monitored and recorded at every facility. This regulation does not specify any pressure to be maintained, only that the pressure be monitored and recorded. The Agency may require monitoring of parameters that indicate proper operation and maintenance, whether or not they relate directly to control devices. Records of the pressure enable enforcement personnel to compare the pressure with the baseline pressure established during the performance test. This parameter is an indicator of the proper operation and maintenance and relates to effectiveness of emission capture.

The requirement that the capture equipment be visually inspected and that all deficiencies be noted and corrected is critical to ensure proper operation of the capture equipment at the levels observed during the performance test. The once per month frequency for inspections has been determined to be reasonable. The owner or operator may, of course, increase the frequency of inspections.

Comment: One commenter (IV-D-4) states that the definitions of an EAF affected facility in the BID, Vol. I, and in Section 271a(a) of the regulation are not the same. Also, the definitions presented do not include all of the necessary equipment (such as cranes, ladles, additive systems, etc.) for the production of molten steel. The commenter recommends that an EAF shop be defined as one which consists of all equipment that must be required to produce molten steel. The commenter states that the BID does not make it clear that no one particular equipment change would necessarily constitute reconstruction. Thus, the commenter recommends deletion of the specific equipment listing.

Response: The affected facility definition in Section 271a(a) and the identification of components (48 FR 37349 and BID Vol. I, page 5-3) that would be examined in determinations of modification and reconstruction are not the same. Section 271a(a) defines the EAF to which the proposed regulation is applicable. On the other hand, the proposal preamble and the BID identify the components that can affect the rate of emissions and, thus, compliance. These definitions provide information appropriate to the specific context, and there is no inconsistency. In general, modifications are "any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies . . ." (40 CFR 60.14[a]). Reconstruction means the replacement of components of an existing facility to such an extent that: (1) the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and (2) it is technologically and economically feasible to meet the applicable standards set forth in this part (see 40 CFR 60.15[a] and [b]). Because it can change the emission rate or costs of control, for purposes of modification and reconstruction determinations, the emission control equipment is included in the definition relating to these determinations. However, the control equipment does not itself create emissions and, thus, is not considered to be part of the affected facility for purposes of the regulation.

The commenter requests that the definition of the affected facility be expanded to include items in a shop such as ladles, cranes, and additive systems. Available information suggests that ancillary equipment does not cause or contribute to emissions (see 48 FR 37340) or change the emission rate from an EAF and, thus, is not appropriate for inclusion in the definition of an EAF affected facility. If the commenter's additions were identified as affected facilities, they would be separate affected facilities. The EAF is the practical integral emission source and is, therefore, the unit to which the proposed regulation applies. The Agency believes that the terms EAF and shop in Section 271a(a) should remain as defined.

With respect to deleting the paragraph containing examples of equipment that might be examined in reconstruction considerations (48 FR 37349), the preamble clearly states that no one of the changes would constitute reconstruction, and, thus, no ambiguity exists that would create the enforcement problem the commenter anticipates. The equipment list merely suggests items to consider in making a reconstruction determination.

Comment: One commenter (IV-D-2) states that there may be a carbon monoxide (CO) hazard that would require use of airpacks by testing personnel during either in-stack or high-volume testing.

Response: Of the 19 plants providing the test data used in developing the data base to support the revised NSPS, 8 plants were tested for CO; of those 8, only 4 had measurable CO in the gas downstream of the collectors. In none of the tests was it necessary that test personnel use airpacks. However, if a situation arises where CO is a test hazard, the test personnel would be expected to use appropriate equipment for which the costs would be negligible.

Comment: One commenter (IV-D-5) notes that jet pulse fabric filters have not been given consideration in developing the revised standards for EAF's and AOD's in steel plants. The commenter states that the use of these fabric filters is popular, and, therefore, he believes they should be investigated.

Response: "Jet pulse" refers to a pulse-jet fabric filter cleaning method. At present, fabric filters using a reverse air flow cleaning mechanism are typical on EAF's and AOD vessels in steel plants. Of 21 plants visited during development of the original and the revised NSPS, 14 had fabric filters with a reverse air flow cleaning mechanism, 6 used a shaker type mechanism, and only 1 used a pulse-jet cleaning mechanism. The one fabric filter utilizing a pulse-jet cleaning mechanism was tested during development of the revised standards and achieved the standard even during furnace upset conditions.

In summary, the pulse-jet fabric filter has been investigated and can be used to comply with the proposed particulate mass emission limit. This standard of performance is expressed as an emission limit to permit the EAF owner or operator to select a control device of his own choosing that will comply with the standard.

Comment: One commenter (IV-D-3) requests that the word "daily" be deleted from 40 CFR 60 Sections 273(c) and 273a(c) and that the words "Method 9" in these sections be replaced with "Section 275(i) [275a(c)] of this subpart." The commenter recommends these changes to make it clear that Reference Method 9 visible emission observations are required for not more than 5 days per week.

Response: Use of "daily" is confusing and, thus, the commenter's suggested change to the regulation has been made.

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-450/3-82-020b		

4. TITLE AND SUBTITLE	5. REPORT DATE
Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels in Steel Plants--Background Information for Promulgated Standards of Performance	August 1984
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Air Quality Planning and Standards U. S. Environmental Protection Agency Research Triangle Park, North Carolina 27711	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. 68-02-3059
12. SPONSORING AGENCY NAME AND ADDRESS Director for Air Quality Planning and Standards Office of Air and Radiation U. S. Environmental Protection Agency Research Triangle Park, North Carolina 27711	13. TYPE OF REPORT AND PERIOD COVERED
	14. SPONSORING AGENCY CODE EPA/200/04

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Standards of performance for the control of particulate matter emissions from electric arc furnaces and argon-oxygen decarburization vessels at new, modified, or reconstructed steel plants are being promulgated under the authority of Sections 111, 114, and 301(a) of the Clean Air Act, as amended. These standards would apply to those affected facilities that commence construction on or after August 17, 1983, the date of original proposal. This document contains a summary of the public comments on the proposed revised standards and the EPA's responses, as well as summary economic and environmental impact statements.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Pollution Control Standards of Performance Steel Plants Particulate Matter	Air Pollution Control	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Unlimited	Unclassified	38
	20. SECURITY CLASS *(This page)*	22. PRICE
	Unclassified	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

United States
Environmental Protection
Agency

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