ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 60]

FERROALLOY PRODUCTION FACILITIES

Standards of Performance for New Stationary Sources

Pursuant to section 111 of the Clean Air Act, the Administrator herein proposes standards of performance for new ferroalloy production facilities.

On December 23, 1971, the first standards of performance were promulgated (36 FR 24876). Those were for affected facilities at new fossil fuel-fired steam generators, incinerators, portland cement plants, nitric acid plants, and sulfuric acid plants. Since that time, additional standards have been promulgated for other categories of sources (March 8, 1974, 39 FR 9308) and several other publications in the FEDERAL REGISTER have amended or corrected the standards.

As prescribed by section 111, proposal of standards for ferroalloy production facilities was preceded by the Administrator's determination that these plants contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare and by his publication of this determination in this issue of the FEDERAL REGISTER.

Ferroalloy production facilities were selected for the development of standards based on expected growth and availability of effective technology. In addition, ferroalloy production facilities were recommended for consideration of standards in the Report of the Committee on Public Works, U.S. Senate, September 17, 1970.

These standards apply to the emission of particulate matter and carbon monoxide from ferroalloy electric submerged arc furnaces. The basis for the proposed standards includes the results of measurements of emissions conducted by industry, the Environmental Protection Agency and local agencies; data derived from available technical literature; information gathered during visits to pollution control agencies and plants in the United States and abroad; and comments and suggestions solicited from experts. The proposed standards reflect the degree of emission limitation achievable through the application of the best system of emission reduction which, taking into account the cost of achieving such reduction, the Administrator has determined to have been adequately demonstrated.

Detailed information on the factors considered in arriving at the proposed standards, including economic data and summaries of test data, may be found in Background Information on Standards of Performance: Electric Submerged Arc Furnaces Producing Ferroalloys which is available free of charge from the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, attention: Mr. Don R. Goodwin.

It is emphasized that the costs due to the proposed standards are considered reasonable for new sources. It is not implied that the same costs apply to the retrofitting of existing sources.

Provisions in § 60.8(b) allow the owner/operator to show compliance with the standard of performance by use of an equivalent test method, alternative test methods or other means upon approval by the Administrator. These provisions permit construction of some types of control devices such as monitor and open or pressurized fabric filters, the emissions from which cannot be measured by reference methods currently in Appendix A of 40 CFR Part 60. The alternative to such a provision appeared to be a ban of certain types of control devices. In the case of an open or pressurized fabric filter, factors such as a significantly lower installation cost and ease of identification and replacement of leaking bags make it superior to the closed top fabric filter system for this application. Such practical considerations argued in favor of avoiding the loss of an effective control system which would ensue from a prohibition of systems not amenable to representative sampling. The owner/operator of an affected facility should submit for review under § 60.6 the plans for construction and/or testing of control systems which are not readily amenable to representative testing.

A decision was made against requiring that the ferroalloy industry contruct only sealed furnaces, a requisite part of the best demonstrated air pollution control technology. Although sealed ferroalloy furnaces are inherently superior from an air pollution control aspect, it is the Administrator's judgment that restricting the industry to this process could ultimately result in limited product flexibility and possible decreased intercorporate competition that outweigh the incremental benefits of the additional reduction in air pollution. The Office of Research and Development is investigating the technical and economic feasibility of using totally enclosed furnaces to produce all types of ferroalloys. That study could ultimately result in standards based on sealed furnaces within several years.

The alloys affected by the standards of performance account for over 90 percent of the total United States ferroalloy production. The standards for particulate matter emissions are more stringent than typical State process weight regulations for production of most ferroalloys. However, the same type of control equipment now commonly used in the industry (baghouses or scrubbers) will be required to meet the standards of performance for particulate matter. When a sealed furnace is used, the standards will require combustion of the carbon monoxide off-gas.

Visible emission limitations are included to ensure that adequate hooding is installed to capture fumes from the furnace during ore reduction and fumes from the tapping operation. This will require an evaluation of the visibility of emissions within the building which houses the ferroalloy furnace. These are the first standards of performance which regulate the visibility of emissions within a building. Such restrictions are within the regulatory authority of EPA if those pollutant emissions can reasonably be expected to ultimately exit from the facility into the atmosphere. A restriction on fume which eludes capture by the air pollution control system appears the only practical way of assuring that the industry makes every effort to minimize the escape of the voluminous emissions from the ore reduction and tapping operations.

The proper use of and test methods for opacity standards are presently being reconsidered by the Agency in response to remands from the U.S. Court of Appeals for the District of Columbia Circuit in Portland Cement Association v. Ruckelshaus, 486 F.2d 375 (1973), and Essex Chemical Corp. v. Ruckelshaus, 486 F.2d 427 (1973). The response to the remand in the Portland Cement case should be completed shortly. At that time, the Agency will promulgate or propose such revisions of its opacity standards or test methods as it deems necessary or desirable. In accordance with section 117(f) of the Act, publication of these proposed amendments to 40 CFR was preceded by consultation with appropriate advisory committees, independent experts and Federal departments and agencies. In the course of these consultations, the Department of Commerce has questioned the establishment of visible emissions (opacity) standards. The Department of Commerce believes that opacity limits have not been satisfactorily correlated to give rates of particulate concentration emissions or mass emissions to establish opacity as a standard. Further, Commerce has questioned whether such standards would be subject to accurate visual determination. Commerce, therefore, recommended that opacity limits not be adopted as a standard where a particulate concentration or mass emissions standard is established. Commerce believes such opacity limits should only be used in those cases to create a rebuttable presumption of a violation of the particulate or mass emissions standards. Commerce believes such presumption could, for example, be rebutted by providing a continuous opacity monitor record showing a visual opacity observation to be in error; and/or by a showing that the particulate concentration or mass emissions standards was not exceeded at the time the opacity limit was exceeded. Commerce believes such a showing could be made by a performance test. If the owner or operator wished to use such test to show that he was not in violation of the mass or concentration standard at the time the opacity limit was exceeded, he must be able to establish the critical plant and control operating parameters that existed at the time of the observed opacity violation by a system of continuous monitoring and recording of such data so that such conditions can be duplicated at the time of the test.

EPA does not support the approach suggested by the Department of Commerce and is proposing opacity standards

in the regulation. EPA believes that the opacity concept is both technically sound and the most practical and inexpensive way to insure that control equipment is adequately maintained and operated between performance tests. A performance test conducted after a source was observed to be in violation of the opacity standard would not in EPA's opinion necessarily resolve the question whether, at the time of the observed violation, the source was meeting the concentration standard. During the period between the observed violation of the opacity standard and the time of the performance test, the owner or operator in some cases could take remedial action to bring a non-complying source into compliance. EPA's opinion is that the only way to resolve this problem would be through use of a continuous monitoring system or through performance tests conducted at such frequent intervals as to yield similar results. EPA believes the approach suggested by the Department of Commerce is not a realistic or practical alternative in the absence of an appropriate continuous monitoring system. However, at the request of the Department of Commerce, EPA is submitting for public comment that agency's recommendation and will consider any comments of State officials, industrial representatives, environmentalists, and the general public on this or any other alternative approach.

The standard for CO gas requires only that the gas be flared or otherwise combusted.

The possible adverse environmental impact resulting from the proposed standards has been determined to be negligible. The local impact on ambient air quality of a proposed new furnace should be closely investigated. Under extremely adverse meteorological and topographical conditions a plant which achieves the standards of performance could cause the 24-hour national ambient air quality standard for particulate matter to be exceeded. Control of air pollution from ferroalloy furnaces need not result in a potential water pollution problem. The operator can install a fabric filter collector which uses no water and thus avoid the capital investment and operational problems associated with a water purification system. However, if the owner chooses to install water scrubbers or electrostatic precipitators which use wet gas conditioners, he must treat the water to comply with EPA's effluent guidelines promulgated on February 22, 1974 (39 FR 6806). The standards will require no increase in power consumption over that required to comply with the restrictions of State Implementation Plans.

The particulate collected by the control device will increase the amount of solid wastes requiring disposal. In some countries part of this material is recovered by processing and reintroducing it to the furnace to recover the alloy content and simultaneously minimize the amount of solid waste. The domestic industry disposes of this material as landfill. If disposed of on land, care should be used to ensure long-term protection of surface and sub-surface waters.

The proper management of solid wastes resulting from air pollution control systems should be practiced. Air pollution control technologies generate many different amounts and types of solid wastes and liquid concentrates through the removal of pollutants from air emissions. These substances vary greatly in their chemical and physical composition. A variety of techniques may be employed to dispose of these substances. When thermal processing is the choice for disposal, provisions must be made to ensure minimal reentry of the pollutants into the atmosphere in accordance with State and local regulations. Consideration should also be given to recovery of materials of value in the wastes. When land disposal is selected, practices similar to proper sanitary landfill technology may be followed. The principles set forth in EPA's Land Disposal of Solid Waste Guidelines (40 CFR Part 241) may be used as guidance for acceptable land disposal techniques.

An extensive investigation led to the judgment that the costs resulting from the proposed standards of performance are reasonable. This conclusion is based on the fact that the proposed standards of performance and most existing state standards require comparable control systems. Detailed cost data are provided in the background information material available from Emission Standards and Engineering Division.

Standards sometimes result in a more severe economic impact on smaller firms. This is primarily because economies of scale generally favor larger installations. For loan purposes, the Small Business Administration defines a small ferroalloy producer as one employing less than 250 employees. In 1972, only two firms producing ferroalloys in electric submerged arc furnaces had fewer than 250 employees. Because of the similarity between existing state standards and the proposed standards of performance the cost differential should be negligible. Therefore, the costs are judged reasonable and should not unduly bar entry to the market or expansion of facilities for small businesses.

In accordance with section 117(f) of the Act, publication of these proposed amendments to 40 CFR was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies. Interested persons may participate in this rulemaking by submitting written comments (in triplicate) to the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, attention: Mr. Don R. Goodwin. The Administrator will welcome comments on all aspects of the proposed regulations, including economic and technological issues. All relevant comments received not later than 45 days from the date of this proposal will be considered. Comments received will be available for public inspection at the Office of Public Affairs, 401 M Street SW., Washington, D.C. 20460.

This notice of proposed rulemaking is issued under the authority of sections 111 and 114 of the Clean Air Act, as amended (42 U.S.C. 1857c-6 and 9).

JOHN QUARLES,
Acting Administrator.

OCTOBER 11, 1974.

It is proposed to amend Part 60 of Chapter I, Title 40 of Code of Federal Regulations by adding Subpart Z as follows:

Subpart Z—Standards of Performance for Ferroalloy Production Facilities

AUTHORITY: Secs. 111, 114, Pub. L. 91-604 (42 U.S.C. 1857c-6 and 9).

§ 60.260 Applicability and designation of affected facility.

The provisions of this subpart are applicable to the following affected facilities: Electric submerged arc furnaces which produce silicon metal, ferrosilicon, calcium silicon, silicomanganese zirconium, ferrochrome silicon, silvery iron, high-carbon ferrochrome, charge chrome, standard ferromanganese, silicomanganese, ferromanganese-silicon, or calcium carbide; and dust-handling equipment.

§ 60.261 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in Subpart A of this part.

(a) "Electric submerged arc furnace" means any furnace wherein electrical energy is converted to heat energy by transmission of current between electrodes partially submerged in the furnace charge.

(b) "Electrode" means a conductor by which the electrical current enters or leaves the furnace charge.

(c) "Furnace charge" means any material introduced into the furnace and may consist of, but is not limited to, ores, slag, carbonaceous material, and limestone.

(d) "Slag" means the more or less completely fused and vitrified matter separated during the reduction of a metal from its ore.

(e) "Tapping" means the process whereby slag or product is removed from the furnace.

(f) "Tapping period" means that time duration from initiation of the process of opening the tap hole to plugging of the tap hole.

(g) "Furnace cycle" means the time period from completion of a furnace product tap to the completion of the next consecutive product tap.

(h) "Tapping station" means that general area where molten product or slag is removed from the electric submerged arc furnace.

(i) "Furnace power input" means resistive electrical power input to an electric submerged arc furnace, as measured at the furnace transformer.

(j) "Fugitive emission" means any emission generated by the furnace (including fumes from the tapping station during the tapping cycle) which is not captured by a hood and conducted to an air pollution control device.

(k) "Dust-handling equipment" means any equipment used to handle particulate matter collected by the control device and located at or near the control device for an electric submerged arc furnace subject to § 60.260.

(l) "Control system" means the gas cleaning device and any equipment (including ducts, hoods, etc.) used to capture or transport particulate matter generated by an affected facility to the gas cleaning device.

(m) "Standard ferromanganese" means that alloy as defined by A.S.T.M. designation A99–66.

(n) "Silicomanganese" means that alloy as defined by A.S.T.M. designation A483–66.

(o) "Calcium carbide" means material containing 70 to 85 percent calcium carbide by weight.

(p) "High-carbon ferrochrome" means that alloy as defined by A.S.T.M. designation A101–66 grades HC1 through HC6.

(q) "Charge chrome" means that alloy containing 52 to 70 percent by weight chromium, 5 to 8 percent by weight carbon, and 3 to 6 percent by weight silicon.

(r) "Silvery iron" means any ferrosilicon, as defined by A.S.T.M. 100–69, which contains less than 30 percent silicon.

(s) "Ferrochrome silicon" means that alloy as defined by A.S.T.M. designation A482–66.

(t) "Silicomanganese zirconium" means that alloy containing 60 to 65 percent by weight silicon, 1.5 to 2.5 percent by weight calcium, 5 to 7 percent by weight zirconium, 0.75 to 1.25 percent by weight aluminum, 5 to 7 percent by weight manganese, and 2 to 3 percent by weight barium.

(u) "Calcium silicon" means that alloy as defined by A.S.T.M. designation A495–64.

(v) "Ferrosilicon" means that alloy as defined by A.S.T.M. designation A100–69 grades A, B, C, D, and E which contains 50 or more percent by weight silicon.

(w) "Silicon metal" means any silicon alloy containing more than 96 percent silicon by weight.

(x) "Ferromanganese silicon" means that alloy containing 63 to 66 percent by weight manganese, 28 to 32 percent by weight silicon, and a maximum of 0.08 percent by weight carbon.

§ 60.262 Standards for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 0.45 kg/MW-hr (0.99 lb/MW-hr) while that facility produces silicon metal, ferrosilicon, calcium silicon, or silicomanganese zirconium.

(2) Contain particulate matter in excess of 0.23 kg/MW-hr (0.51 lb/MW-hr) while that facility produces high-carbon ferrochrome, charge chrome, standard ferromanganese, silicomanganese, calcium carbide, ferrochrome silicon, ferromanganese silicon, or silvery iron.

(3) Exhibit 20 percent opacity or greater. This opacity requirement shall apply to any emissions from all affected facilities except as follows:

(i) Any emissions generated within the furnace which escape the control system shall not be visible without the aid of instruments.

(ii) Any emissions from the tapping station which escape the control device shall not be visible without the aid of instruments for at least 60 percent of each tapping period.

(iii) Any emissions from the dust handling equipment shall not exhibit 10 percent opacity or greater.

§ 60.263 Standard for carbon monoxide.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain, on a dry basis, 20 or greater volume percent of carbon monoxide. Combustion of such gases under conditions acceptable to the Administrator shall constitute compliance with this section. Acceptable conditions include, but are not limited to, flaring of gases or use of gases as fuel for other processes.

§ 60.264 Emission monitoring.

(a) The owner or operator shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of the opacity of emissions discharged into the atmosphere from the control device.

(b) For the purpose of reports required under § 60.7(c), periods of excess emissions that shall be reported are defined as all 1-minute periods during which the opacity is 20 percent or greater.

§ 60.265 Monitoring of operations.

(a) The owner or operator of any affected facility subject to the provisions of this subpart shall maintain daily records of the following information:

(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).

(b) The owner or operator of any affected facility subject to the provisions of this subpart shall install, calibrate, maintain, and operate a device to measure and continuously record the power consumption of the furnace. The device shall have an accuracy of ±5 percent over its operating range.

§ 60.266 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided in § 60.8(b), shall be used to determine compliance with the standards prescribed in § 60.262 and § 60.263 as follows:

(1) Method 5 shall be used for determining concentration of particulate matter and the associated moisture content except that the heating systems specified in paragraphs 2.1.2 and 2.1.4 of Method 5 shall not be used or required when the carbon monoxide content of the gas stream exceeds 10 percent by volume, dry basis,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 5, the sampling time for each run shall include an integral number of furnace tapping cycles. The sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be 1.8 dscm (64 dscf) when sampling emissions from open furnaces with wet scrubber control devices, sealed furnaces, or semi-enclosed furnaces. When sampling emissions from other types of installations, the sampling time for each run shall be at least 200 minutes and the minimum sample volume shall be 5.7 dscm (200 dscf). Shorter sampling times or smaller sampling volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and particulate matter emissions can be accurately determined by applicable test methods and procedures.

(d) When compliance with § 60.263 is to be attained by combusting the gas stream in a flare, the location of the sampling site for particulate matter shall be upstream of the flare.

(e) For each run, particulate matter emissions expressed in kg/hr shall be determined for each exhaust stream at which emissions are quantified using the following equation:

$$E_a = C_a Q_s$$

where:

E_a = emissions of particulate matter in kg/hr.
C_a = concentration of particulate matter in kg/dcm as determined by Method 5.
Q_s = volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

(f) For Method 5, particulate matter emissions from the affected facility, expressed in kg/MW-hr, shall be determined for each run using the following equation:

$$E = \frac{\sum_{a=1}^{N} E_a}{p}$$

where:

E = emissions of particulate from the affected facility, in kg/MW-hr.
N = total number of exhaust streams at which emissions are quantified.
E_a = emissions of particulate matter from each exhaust stream in kg/MW-hr, as determined in paragraph (e) of this section.
p = average power input to the furnace during the sampling period, in megawatts as determined according to § 60.265(b).

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