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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[AD-FRL 1718-2]

Standards of Performance for New Stationary Sources; Lead-Acid Battery Manufacture

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This rule establishes standards of performance which limit atmospheric emissions of lead from new, modified, and reconstructed facilities at lead-acid battery plants. The standards implement Section 111 of the Clean Air Act, and are based on the Administrator's determination that lead-acid battery manufacturing facilities contribute significantly to air pollution, which may reasonably be anticipated to endanger public health or welfare. The intended effect of this regulation is to require new, modified, and reconstructed lead-acid battery manufacturing facilities to control lead emissions within the specified limits, which can be achieved through the use of the best demonstrated system of continuous emission reduction. A new reference method for determining compliance with lead standards is also promulgated.

EFFECTIVE DATE: April 16, 1982.

Under Section 307(b)(1) of the Clean Air Act, judicial review of this new source performance standard is available *only* by the filing of a petition for review in the United States Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this rule. Under Section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESSES:

Background Information Document. The Background Information Document (BID) for the promulgated standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777. Please refer to "Lead-Acid Battery Manufacture, Background Information for Promulgated Standards," EPA-450/3-79-028b.

Docket. Docket No. OAQPS-79-1, containing supporting information used in developing the promulgated standards, is available for public

inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street SW., Washington, D.C. 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. Gene W. Smith, Standards Development Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5624.

SUPPLEMENTARY INFORMATION:

The Standards

The promulgated standards will limit atmospheric lead emissions from new, modified, or reconstructed facilities at any lead-acid battery manufacturing plant which has the design capacity to produce in one day batteries which would contain, in total, an amount of lead equal to or greater than 5.9 Mg (6.5 tons). The facilities which are affected by the standards and the emission limits for these facilities are listed below:

Facility	Lead emission limit
Lead oxide production.....	5.0 mg/kg (0.010 lb/ton).
Grid casting.....	0.40 mg/dscm (0.00018 gr/dscf).
Paste mixing.....	1.00 mg/dscm (0.00044 gr/dscf).
Three-process operation.....	1.00 mg/dscm (0.00044 gr/dscf).
Lead reclamation.....	4.50 mg/dscm (0.00198 gr/dscf).
Other lead emitting operations.	1.00 mg/dscm (0.00044 gr/dscf).

The emission limit for lead oxide production is expressed in terms of lead emissions per kilogram of lead processed, while the limits for other facilities are expressed in terms of lead concentrations in exhaust air.

A standard of 0 percent opacity is promulgated for emissions from lead oxide production, grid casting, paste mixing, three process operation, and "other lead-emitting" facilities. A standard of 5 percent opacity is promulgated for lead reclamation facilities. The promulgated standards also require continuous monitoring of the pressure drop across any scrubber used to control emissions from an affected facility to help insure proper operation of the scrubber. Performance tests are required to determine compliance with the promulgated standards. A new reference method, Method 12, is to be used to measure the amount of lead in exhaust gases, and Method 9 is to be used to measure opacity. Process monitoring is required during all tests.

In the preamble to the proposed regulation, the decision by the Administrator not to propose standards for sulfuric acid mist emissions from the formation process was discussed. The public was specifically invited to submit comments with supporting data on this issue. Only one comment addressing this issue was received and, while the commenter suggested that acid mist emissions need EPA attention, no specific information was provided to refute the basis for the Administrator's decision not to regulate. Therefore, the Administrator does not plan to take any further action regarding acid mist emissions from lead-acid battery manufacture at this time. EPA is required to review new source performance standards four years from the date of promulgation, and if appropriate, revise them. The decision not to regulate acid mist emissions may be reconsidered at that time.

Summary of Environmental, Energy, and Economic Impacts

There are approximately 190 lead-acid battery manufacturing plants in the United States, of which about 100 have been estimated to have capacities above the small size cutoff. These plants are scattered throughout the country and are generally located in urban areas near the market for their batteries. Projections of the growth rate of the lead-acid battery manufacturing industry range from 3 to 5 percent per year over the next 5 years. Most of the projected increase in manufacturing capacity is expected to take place by the expansion of large plants (producing over 2000 batteries per day).

In general, States do not currently regulate atmospheric lead emissions from lead-acid battery plants. However, State implementation plan (SIP) particulate regulations generally require some control of these emissions. The average degree of control required by SIP regulations was used as a baseline for the assessment of the environmental and economic impacts of the new source performance standards for lead-acid battery manufacture. At some existing plants, emissions are controlled to a greater extent than is required by typical State particulate regulations. In addition, States are developing implementation plans to insure the attainment and maintenance of the national ambient air quality standard (NAAQS) for lead, which was promulgated in December 1977 (42 FR 63076). The State implementation plans for lead are expected to include regulations which will require more control of atmospheric lead emissions

than is currently required under typical State particulate regulations.

New facilities and facilities undergoing modification and reconstruction in the United States over the next 5 years would emit about 95 Mg (104 tons) of lead to the atmosphere in the fifth year, if their emissions were controlled only to the extent required by current State particulate regulations. The promulgated standards will reduce potential lead emissions from new, modified, and reconstructed facilities to about 3.1 Mg (3.4 tons) in the fifth year. The promulgated standards will also result in decreased nonlead particulate emissions from affected facilities, since equipment installed for the purpose of controlling lead-bearing particulate emissions will also control nonlead-bearing particulate emissions.

For a new or completely reconstructed plant using impingement scrubbing to control lead emissions from the grid casting and lead reclamation facilities and fabric filtration to control emissions from all other affected facilities, the fractional increase in the lead content of plant wastewater attributable to the standards will be about 0.6 percent. It is anticipated that, in early 1981, EPA's Office of Water and Waste Management will propose a regulation which would require zero lead discharge in the wastewater from grid casting and lead reclamation facilities. In order to achieve zero discharge from these facilities, scrubber effluent would have to be clarified and recycled. Although not directly attributable to the promulgated NSPS for air emissions, the costs of clarifying and recycling blowdown from scrubbers controlling grid casting and lead reclamation emissions has been considered in the development of the promulgated NSPS. The annualized cost of controlling water emissions from grid casting and lead reclamation facility scrubbers would be less than 1 percent of the costs attributable to the promulgated standards for a completely modified or reconstructed 2000 battery-per-day plant. The promulgated NSPS will not have a significant impact on emissions of solid waste.

The energy needed to operate control equipment required to meet the promulgated standards at a new plant will be approximately 2.7 percent of the total energy needed to run the plant. The incremental energy demand resulting from the application of the promulgated standards to new, modified, and reconstructed facilities over the next five years will be about 2.8 gigawatt hours of electricity in the fifth year. The fifth-year increase in demand for heat

energy resulting from the promulgated standards will be about 50 PJ/yr (48×10^9 BTU/yr), or the equivalent of about 8.1 thousand barrels of oil per year.

The capital cost of the installed emission control equipment necessary to meet the promulgated standards on all new, modified, and reconstructed facilities during the first five years of the standards will be approximately \$8.2 million. The total annualized cost of operating this equipment in the fifth year of the standards will be about \$3.9 million.

These costs and energy and environmental impacts are considered reasonable, and are not expected to prevent or hinder expansion on the lead-acid battery manufacturing industry. Economic analysis indicates that, for plants with capacities larger than the small size cutoff, the costs attributable to the standards can be passed on with little effect on sales. The average incremental cost associated with the promulgated standards will be about 30¢ per battery. This is about 1.6 percent of the wholesale price of a battery.

Public Participation

Prior to proposal of the standards, interested parties were advised by public notice in the Federal Register of a meeting of the National Air Pollution Control Techniques Advisory Committee to discuss the standards recommended for proposal. This meeting was held September 27-28, 1977. The meeting was open to the public and each attendee was given ample opportunity to comment on the standards recommended for proposal. The standards were proposed in the Federal Register on January 14, 1980 (45 FR 2790). Public comments were solicited at that time and, when requested, copies of the Background Information Document (BID) were distributed to interested parties. To provide interested persons the opportunity for oral presentation of data, views, or arguments concerning the proposed standards, a public hearing was held on February 13, 1980, at Research Triangle Park, North Carolina. The hearing was open to the public and each attendee was given an opportunity to comment on the proposed standards. The public comment period extended from January 14, 1980 to March 14, 1980.

Twenty-one comment letters were received on the proposed standards of performance. These comments have been carefully considered and, where determined to be appropriate by the Administrator, changes have been made in the standards which were proposed.

Significant Comments and Changes to the Proposed Regulation

Comments on the proposed standards were received from industry representatives, State air pollution control agencies, and two Federal agencies. Detailed discussion of these comments can be found in Volume II of the Background Information Document (BID). The major comments can be combined into the following areas: general, emission control technology, economic impact, legal considerations, test methods and monitoring, reporting and recordkeeping, and other considerations.

General

Facilities at any plant with a production capacity of less than 500 batteries per day (bpd) were exempted under the proposed standards. Some commenters felt that the number of batteries which can be produced at a plant was not the appropriate criterion on which to base the size cutoff. It was pointed out that lead-acid batteries are produced in a variety of sizes, and that emissions from battery production are probably related more to the amount of lead used to produce batteries than to the number of batteries produced.

These are considered to be reasonable comments. Economic impacts of standards as well as emissions are expected to be related to the amount of lead used in a particular battery production operation rather than to the number of batteries produced. At the time of proposal, it was estimated that odd-sized lead-acid batteries represented a very small share of the lead-acid battery market; however, the comments received on the proposed standards indicated that a significant number of odd-sized batteries are produced. Industrial lead-acid batteries, which can be as much as 50 times larger than automobile batteries, are estimated to represent about 7 percent of total U.S. lead-acid battery production.

Therefore, the small size cutoff for the promulgated regulation is expressed in terms of lead throughput. The promulgated standards will affect new, modified, and reconstructed facilities at any plant with the capacity to produce in one day batteries which would contain, in total, an amount of lead greater than or equal to 5.9 Mg (6.5 tons). This cutoff is equivalent to the 500 bpd cutoff for plants producing typical automobile batteries. The level is based on an average battery lead content of 11.8 kg (26 lb) of lead per battery.

One commenter questioned whether plant capacity is to be determined based

on the maximum demonstrated production rate or the estimated maximum production rate, for the purposes of the small size cutoff.

For the purposes of the small size cutoff, the parameter to be used to determine the production capacity of a plant is its design capacity. The design capacity is the maximum production capability of the plant and can be determined using the design specifications of the plant's component facilities, taking into account the facility with the smallest rated production capacity. The design capacity of a plant can be confirmed by checking production records. The figure cited as a plant's production capacity should not be less than the maximum production rate in the plant's records.

Several commenters felt that the 500 bpd cutoff should be raised to 2000 bpd. This contention was based on the fact that the Federal regulations which set minimum standards for State implementation plans (SIPs) for the lead national ambient air quality standard do not require ambient air quality monitoring or atmospheric dispersion analyses for plants smaller than 2000 bpd (40 CFR 51.80(a)(1) and 51.84(a)). The commenters considered these cutoffs to be indicative of a decision by EPA that battery plants smaller than 2000 bpd are not material contributors to lead air pollution.

It should be noted that the Federal regulations to which the commenters referred only set minimum standards for a lead SIP. Also, as discussed in the Legal Considerations section of this preamble, the regulatory approach for NAAQS regulations promulgated under Section 109 of the Clean Air Act differs from that for standards of performance promulgated under Section 111 of the Act. The small size cutoff for the standards of performance for lead-acid battery manufacture is based on a thorough analysis of the economic impacts of these standards. The analysis indicated that the economic impact of standards on plants smaller than about 250 bpd could be severe, but showed that the economic impact would be reasonable for plants with capacities greater than or equal to 500 bpd. None of the commenters submitted information indicating that the economic impact of standards might be severe for plants in the 500 to 2000 bpd size range. Therefore, although the small size cutoff is now expressed in terms of lead throughput rather than battery production, the level of the cutoff remains at the lead throughput capacity which corresponds to a production capacity of 500 bpd.

Several commenters contended that the proposal of a 0 percent opacity standard for all affected facilities was impractical. These commenters were concerned that emissions from facilities which emit fine particles would exceed 0 percent opacity. Also, some were concerned that emissions from facilities controlled by fabric filters would exceed 0 percent opacity during fabric filter cleaning. However, one commenter stated that the 0 percent opacity standard appears achievable for all affected facilities.

The 0 percent opacity standard for lead oxide manufacturing, grid casting, paste mixing, three-process operation and "other lead-emitting" facilities is considered reasonable. Lead oxide manufacturing, grid casting, paste mixing, and three-process operation facilities were observed by EPA to have emissions with 0 percent opacity for periods of 3 hours and 19 minutes, 7 hours and 16 minutes, 1 hour and 30 minutes, and 3 hours and 51 minutes, respectively. Under the promulgated standards, compliance with the opacity standard is to be determined by taking the average opacity over a 6-minute period, according to EPA Test Method 9, and rounding the average to the nearest whole percentage. The rounding procedure is specified in order to allow occasional brief emissions with opacities greater than 0 percent, which may occur during fabric filter cleaning. For grid casting, the observations were made at a facility controlled by an impingement scrubber. For lead oxide production and three-process operation facilities, the observation periods included fabric filter cleaning phases.

The opacity standard for lead reclamation has been changed to 5 percent in the promulgated standards. A standard of 0 percent opacity was originally proposed for lead reclamation, although emissions with opacities greater than 0 percent were observed from the facility tested by EPA. The 0 percent opacity standard was considered reasonable, because the facility tested by EPA was controlled by an impingement scrubber and the proposed emission limit for lead reclamation was based on transfer of fabric filtration technology. As noted in the CONTROL TECHNOLOGY discussion, the final emission limit for lead reclamation is based on the demonstrated emission reduction capabilities of the impingement scrubber on the facility tested by EPA. The final opacity standard of 5 percent is based on observations at this facility. Emissions from this facility were observed for 3 hours and 22 minutes.

The highest 6-minute average opacity during the 3 hour 22 minute observation period was 4.8 percent. Therefore, the 5 percent opacity standard for lead reclamation is considered achievable.

Under the general provisions applicable to all new source performance standards, the operator of an affected facility may request the Administrator to determine the opacity of emissions from the affected facility during the initial performance test (40 CFR 60.11). If the Administrator finds that the affected facility is in compliance with the applicable standards for which performance tests are conducted, but fails to meet an applicable opacity standard, the operator of the facility may petition the Administrator to make an appropriate adjustment to the opacity standard for the facility.

Some commenters stated that EPA should establish a relationship between opacity and emissions before setting opacity standards.

Opacity limits are being promulgated in addition to mass emission limits because the Administrator believes that opacity limits provide the most effective and practical method for determining whether emission control equipment, necessary for a source to meet the mass emission limits, is continuously maintained and operated properly. It has not been the Administrator's position that a single, constantly invariant and precise correlation between opacity and mass emissions must be identified for each source under all conditions of operation. Such a correlation is unnecessary to the opacity standard, because the opacity standard is set at a level such that if the opacity standard is exceeded for a particular facility, one would expect that the applicable emission limitation will also be exceeded. Furthermore, as noted above, a mechanism is provided in the general provisions whereby the operator of a facility can request that a separate opacity standard be set for that facility if, during the initial performance test, the Administrator finds that the facility is in compliance with all other applicable standards but fails to meet the respective opacity standard.

One commenter felt that additional testing should be conducted before standards are promulgated. The commenter contended that the EPA data base is narrow, and that tests should be conducted to determine the variability of the efficiency of emission control devices.

The Administrator has determined that the data base developed by EPA provides adequate support for the

promulgated new source performance standards. The promulgated standards are based on tests of a total of eight facilities which have been determined by EPA to be well controlled and typical of facilities used in the industry. As noted by some commenters, EPA has not tested emissions from facilities producing maintenance-free or low-maintenance batteries or Barton lead oxide production facilities. Differences between such facilities and the facilities tested by EPA are discussed in detail below and in the Emission Control Technology section. These differences are not expected to have a significant effect on the controlled lead concentrations achievable using the emission control techniques tested by EPA. Commenters did not refer to nor is EPA aware of any other specific process variations which might influence emissions. The Agency has set the promulgated lead emission limits above the levels achieved in the EPA tests to allow solely for variations caused by factors that the Agency cannot identify at this time.

Some commenters stated that changes have occurred in the lead-acid battery manufacturing industry, which may influence emissions, since the EPA tests were conducted. The changes cited by the commenters were the production of maintenance-free and low-maintenance batteries, and the increasing of volumes of air ventilated from facilities in order to meet more stringent OSHA standards regulating in-plant lead levels.

The commenters briefly described the difference between maintenance-free or low-maintenance batteries and normal-maintenance batteries. The only substantial difference is that a calcium-lead alloy is used to make low-maintenance and maintenance-free batteries, while standard batteries are made using an antimonial lead alloy. This difference influences the grid casting and lead reclamation facilities, where molten lead is processed. The major change is in the makeup of the dross which must be removed from molten lead in these facilities. For grid casting, the calcium alloy also requires the use of soot as a mold release agent. For the antimonial lead alloy used in standard batteries, either soot or sodium silicate can be used.

The different makeup of dross in grid casting and lead reclamation facilities producing maintenance-free and low-maintenance batteries is not expected by EPA to cause noticeable differences in lead emissions between these facilities and facilities producing standard lead-acid batteries. The commenters did not give reasons why

this difference might be expected to affect emissions and EPA is not aware of any. Dross consists of contaminants in the molten lead alloy which float to the surface and must periodically be removed. The presence of a dross layer has an impact on emissions, in that the dross layer serves to reduce fuming from the molten lead. However, this will occur regardless of the composition of the dross layer. Also, because the dross layer is made up chiefly of contaminants from the lead, the entrainment of dross particles in air exhausted from grid casting or lead reclamation facilities will not significantly affect lead emissions. Thus, the effect of the dross layer composition on emissions is expected to be much less than the effects of process operation parameters, such as the frequency of dross removal and the temperature of the molten lead alloy.

The use of soot rather than sodium silicate as a mold release agent in grid casting will not affect uncontrolled lead emissions from this facility. However, the presence of entrained soot in uncontrolled grid casting emissions may require the use of scrubbers rather than fabric filters to control these emissions. This problem is discussed in detail in the EMISSION CONTROL TECHNOLOGY section.

The commenters stated that exhaust volumes for lead-acid battery facilities have been increased as a result of the revised OSHA standards. One commenter contended that this change will increase the concentration of uncontrolled emissions.

It is acknowledged that the exhaust volumes at the facilities tested by EPA may not have been sufficient for attainment of the 50 $\mu\text{g}/\text{m}^3$ OSHA in-plant lead concentration standard. At the time of the tests conducted by EPA the OSHA standard was 200 $\mu\text{g}/\text{m}^3$. Among the practices that plants can employ to meet the new standard are general plant maintenance, employee care, and local ventilation of in-plant lead emission sources. EPA recognizes that if ventilation rates significantly higher than those used at the facilities tested by EPA are used to meet the new OSHA standard, additional lead particles will be drawn into the exhaust streams. However, the exhaust volume increase will be greater than the lead weight increase by a margin sufficient not only to prevent an increase in the lead concentration in the exhaust, but actually to decrease that concentration. Also, the additional lead particles captured as a result of the higher exhaust volumes will consist mainly of large particles which are readily captured by control systems.

One commenter stated that there is a trend in the lead-acid battery manufacturing industry to the use of finer lead oxide in battery pastes in order to increase battery efficiency. The commenter also contended that this particle size change will influence the collection efficiency attainable with fabric filters.

Lead emissions from lead-acid battery manufacture are generated by two mechanisms. Lead oxide fumes are produced in welding, casting, and reclaiming operations, and to a certain extent in lead oxide production. Agglomerates of lead and lead oxide particles are emitted from operations involving the handling of lead oxide, lead oxide paste, and lead grids. The particles which are most difficult to capture are the fume particles. The emission rate and characteristics of the fume particles are not dependent on the size of the lead oxide particles used in battery pastes, but on the temperature of the lead during the operations from which they are emitted. For these reasons, trends in the industry to the use of smaller lead oxide particles are not expected to change the particle size distributions of emissions in such a way that collector performance will be affected.

Emission Control Technology

Some commenters thought that the proposed standards would have required the use of fabric filtration to control emissions.

The proposed standards would not have required that specific control technology be used for any affected facility, nor will the promulgated standards require specific control techniques. Rather, the standards set emissions limits which have been demonstrated to be achievable by the use of the best control systems considering costs, energy impacts, and nonair quality environmental impacts. The standards do not preclude the use of alternative control techniques, as long as the emissions limits are achieved.

The selection of fabric filtration as the best system of emission reduction for grid casting and lead reclamation facilities was criticized by a number of commenters. These facilities are normally uncontrolled or controlled by impingement scrubbers at existing plants. The commenters pointed out that only one grid casting facility in the United States is controlled by a fabric filtration system and that this system has been plagued by fires. They explained that the surfaces of exhaust ducts for grid casting and lead reclamation operations become coated

with hydrocarbons and other flammable materials. For grid casting, these include bits of cork from the molds, oils used for lubrication, and soot, which is often used as a mold release agent. For lead reclamation, hydrocarbons from plastic and other contaminants charged with lead scrap become entrained in exhaust gases and deposit on the walls of exhaust ducts. These materials are readily ignited by sparks which, the commenters contended, are unavoidable.

The commenters stated that fires started in the exhaust ducts will generally propagate to the control system. One commenter indicated that problems caused by such fires are not generally severe for scrubbers, but fires would cause serious damage and emissions excursions if fabric filters were used. The commenters stated that spark arresters would not solve the fire problem, because they too would become coated with flammable materials which would be ignited by sparks.

Apart from the problem of fires, commenters contended that contaminants present in the exhaust gases from grid casting and lead reclamation would cause frequent bag blinding if fabric filters were applied to these facilities. In addition to the materials listed above, sodium silicate, which is often used as a mold release agent for grid casting, was cited by the commenters as an extremely hygroscopic compound which would cause bag blinding. Commenters also felt that the EPA particle size and emissions test data did not support the contention made by EPA that a fabric filter could achieve 99 percent emission reduction for emissions from grid casting and lead reclamation.

The standards for grid casting and lead reclamation have been changed. Based on the information available when standards for lead-acid battery manufacture were proposed, EPA had concluded that fabric filtration could be used to control emissions from grid casting and lead reclamation, and that 99 percent collection efficiency could be attained. The proposed standards for grid casting and lead reclamation were based on tests of uncontrolled emissions from these facilities, and on fabric filter efficiencies demonstrated for the three-process operations facility and for other industries with emissions of similar character to those from lead-acid battery manufacture. The problem of bag blinding can be avoided by keeping the exhaust gases from these facilities at temperatures above their dew points. Also, it was thought that exhaust duct

fires could be prevented by the use of spark arresters. In light of the point made by commenters that spark arresters would not prevent fires, EPA has concluded that the standards for grid casting and lead reclamation facilities should not be based on fabric filters.

The proposed emission limitations for grid casting and lead reclamation might be achieved using a high energy scrubber such as a venturi; however, because of the particle size of emissions from these facilities, a scrubber pressure drop of about 7.5 kPa (30 in. W.G.) would be required. The energy requirement to overcome this pressure drop is not considered reasonable for these facilities. The emissions limits for paste mixing, three-process operation, and other lead-emitting facilities are based on the application of fabric filters with average pressure drops of about 1.25 kPa (5 in. W.G.). Thus, the electricity requirement per unit volume of exhaust gas to operate venturi scrubbers for the grid casting and lead reclamation facilities would be roughly six times the electricity requirement per unit volume to control other plant exhausts. It is estimated that standards based on the application of impingement scrubbers rather than venturi scrubbers to grid casting and lead reclamation facilities will result in a 50 percent decrease in the total electricity necessary to comply with the NSPS while having only a slight effect on the emissions reduction attributable to the NSPS (from 97 percent reduction to 96.7 percent reduction from a typical new plant).

The Administrator has therefore determined that for the lead-acid battery manufacturing industry, impingement scrubbers operating at a pressure drop of about 1.25 kPa (5 in. W.G.) represent the best system of emission reduction considering costs, nonair quality health and environmental impact and energy requirements for grid casting and lead reclamation. Therefore, in the promulgated standards, the emissions limitations for grid casting and lead reclamation have been raised to levels which have been shown to be achievable in tests of impingement scrubbers controlling these facilities. This change represents a change from the regulatory alternative chosen for the proposed standards. The environmental, economic, and energy impacts of the alternative which has been chosen for the promulgated standards are discussed in both Volumes I and II of the BID.

EPA measured lead emissions from two grid casting facilities. One of these

facilities was uncontrolled, and the other was controlled by an impingement scrubber. Average uncontrolled and controlled lead emissions from the scrubber controlled facility were 2.65 mg/dscm (11.6×10^{-4} gr/dscf) and 0.32 mg/dscm (1.4×10^{-4} gr/dscf), respectively. The promulgated standard for grid casting, 0.4 mg/dscm (1.76×10^{-4} gr/dscf), is based on the controlled lead emission rate for this facility. The facility is considered typical of grid casting facilities used in the lead-acid battery manufacturing industry. EPA is not aware of any process variations which would result in a significant increase in the emission concentration achievable using a scrubber control system. The Agency has set the promulgated lead emission limit above the level achieved in the EPA test to allow solely for variations caused by factors that the Agency cannot identify at this time.

Lead reclamation emissions were measured by EPA for a facility controlled by an impingement scrubber. Average lead concentrations in the inlet and outlet streams from the scrubber were 227 mg/dscm (990×10^{-4} gr/dscf) and 3.7 mg/dscm (16×10^{-4} gr/dscf). The standard for lead reclamation, 4.5 mg/dscm (19.8×10^{-4} gr/dscf), is based on the controlled emission rate measured for this facility. This facility is considered typical of lead reclamation facilities used in the lead-acid battery manufacturing industry. EPA is not aware of any process variations which would result in a significant increase in the emission concentration achievable using a scrubber control system. The Agency has set the promulgated lead emission limit above the level achieved in the EPA test to allow solely for variations caused by factors that the Agency cannot identify at this time.

Several commenters criticized the choice of fabric filtration as the best system of emission reduction for the entire paste mixing cycle. The paste mixing operation is a batch operation consisting of two phases: charging and mixing. The paste mixing facility is generally controlled by impingement scrubbing, although fabric filtration is often used to control exhaust from the charging phase. The commenters felt that if fabric filtration were to be used for the entire cycle, the moisture present in the exhaust during the mixing phase would cause bag blinding. Therefore, they requested that the emission limit for paste mixing be raised to a level achievable using impingement scrubbers.

If fabric filters are used to meet the emission limit, bag blinding can be

prevented by keeping paste mixer exhausts at temperatures above their dew points. The energy which would be required to heat the exhaust gases and the costs for providing insulation for ducts and fabric filters applied to paste mixing facilities were taken into consideration in the energy and economic analyses for the new source performance standards. These costs and energy requirements are considered reasonable. In addition, data submitted by one commenter show that the standard for paste mixing is achievable using impingement scrubbers. Tests were conducted of emissions from two scrubber controlled paste mixing facilities, using methods similar to Method 12. These tests indicated average controlled lead emissions of 0.04 mg/dscm (1.09×10^{-4} gr/dscf) and 0.07 mg/dscm (0.30×10^{-4} gr/dscf) for the two facilities. Both of these average concentrations are well below the 1 mg/dscm (4.4×10^{-4} gr/dscf) standard for paste mixing.

Some commenters contended that EPA test data did not adequately support the statement that 99 percent collection efficiency could be achieved for paste mixing emissions using fabric filter filtration. The commenters stated that fabric cleaning periods should be included in the calculation of fabric filter efficiency.

The standard for paste mixing is considered achievable. Emissions from a paste mixing facility were tested by EPA. The average uncontrolled lead concentration from this facility was 77.4 mg/dscm (338×10^{-4} gr/dscf). Thus, the promulgated regulation is expected to require about 98.7 percent control of lead emissions from paste mixing. EPA tests of a fabric filtration system controlling a three-process operation showed an average lead collection efficiency of 99.3 percent. This fabric filtration system underwent bag cleaning during testing. EPA tests and statements made by several commenters indicate that the particle size distribution for paste mixing emissions is similar to that for three-process operation emissions. Emissions from paste mixing are made up of lead oxide agglomerates, while emissions from three-process operation facilities are made up mainly of agglomerates with some other large particles and some fumes. Because of the absence of fumes in paste mixing emissions, emission reductions greater than those demonstrated for the three-process operation facility may be achievable for paste mixing facilities. The above data show that efficiencies greater than 98.7

percent can be achieved for paste mixing emissions.

In addition, EPA tests of a controlled paste mixing facility indicate that the 1 mg/dscm standard for paste mixing is achievable. As noted earlier, paste mixing is a batch process which can be divided into a charging phase and a mixing phase. Emission concentrations are highest during the charging phase. EPA conducted tests of a facility where paste mixing emissions were controlled by two separate systems. At this plant, paste mixing required a total of 21 to 24 minutes per batch. During the charging phase (the first 14 to 16 minutes of a cycle) exhaust from the paste mixer was ducted to a fabric filter which also controlled emissions from the grid slitting (separating) operation. During the mixing phase (the remainder of the cycle), paste mixer exhaust was ducted to an impingement scrubber which also controlled emissions from the grid casting operation. Uncontrolled or controlled emissions for the paste mixer alone were not tested. The average concentration of lead in emissions from the fabric filtration system used to control charging emissions was 1.3 mg/dscm (5.5×10^{-4} gr/dscf). The average lead content of exhaust from the scrubber used to control mixing emissions was 0.25 mg/dscm (1.1×10^{-4} gr/dscf). The minimum time specified in the standard for a test run, 60 minutes (§ 60.374(b)), exceeds the duration of a mixing cycle. Thus, the emission concentration used to determine compliance with the paste mixing standard would be the average of the emission concentrations from charging and mixing. The average lead concentration in controlled emissions from the facility discussed above was about 0.95 mg/dscm (4.2×10^{-4} gr/dscf) which is slightly below the proposed emission limit of 1 mg/dscm (4.4×10^{-4} gr/dscf). A lower average emission concentration could be achieved by using fabric filtration, generally a more efficient control technique than impingement scrubbing, to control emissions from all phases of paste mixing.

Also, as noted earlier, one commenter submitted data showing that the standard for paste mixing is achievable using impingement scrubbing to control emissions from the entire cycle.

Several commenters criticized the fact that the standard for lead oxide production is based on tests conducted at a ball mill lead oxide production facility, but will apply to Barton lead oxide production facilities as well as ball mill facilities. Some commenters stated that the particle size of the oxide

to be collected depends on the type of lead oxide produced. One commenter stated that Barton facilities are more commonly used to produce lead oxide than ball mill facilities.

In both the ball mill process and the Barton process, all of the lead oxide product must be removed from an air stream. In the ball mill process, lead pigs or balls are tumbled in a mill, and the frictional heat generated by the tumbling action causes the formation of lead oxide. The lead oxide is removed from the mill by an air stream. In the Barton process, molten lead is atomized to form small droplets in an air stream. These droplets are then oxidized by the air around them.

EPA tests on a Barton process indicated that Barton and ball mill processes have similar air flow rates per unit production rate. Because these air streams carry all of the lead oxide produced, the concentrations of lead oxide in the two streams must also be similar. Data submitted by one commenter indicate that the percentage of fine particles in lead oxide produced by the Barton process is similar to the percentage of fine particles in lead oxide produced by the ball mill process. The similarities between the concentrations and particle size distributions of the oxide bearing air streams in the Barton and ball mill processes support EPA's contention that a similar level of emission control could be achieved for a Barton process as has been demonstrated for the ball mill process. It should be noted that the Agency has set the promulgated lead emission limit above the level achieved in the EPA test to allow solely for variations caused by factors that the Agency cannot identify at this time.

Some commenters felt that the standard for lead oxide production was too stringent. One commenter stated that the emission rate calculated for a lead-oxide production facility controlled by a cyclone and a fabric filter in series is higher than the standard for lead oxide production.

The emission limit for lead oxide production of 5 milligrams of lead per kilogram of lead processed is considered achievable. The limit is based on the results of a test of emissions from a ball mill lead oxide production facility with a fabric filter control system, which showed an average controlled emission rate of 4.2 mg/kg (8.4 lb/ton) for this facility. The comments on the lead oxide standard were based on calculation and not on emission testing. No reason was given why the calculations might be more reliable than the EPA test data or why the EPA test might not be

representative of the emission level achievable for a well controlled lead oxide production facility.

Several commenters stated that the emission limit for the three-process operation was not supported by the BID for the proposed standards. However, one commenter stated that the emission limit appears achievable.

The limit for the three-process operation is based on the results of EPA tests conducted at four plants where fabric filtration was used to control three-process operation emissions. Each of the sets of tests conducted by EPA showed average controlled lead concentrations below the promulgated limit. The limit was set above the levels shown to be achievable in the four EPA tests to allow solely for variations caused by factors that the agency cannot identify at this time. Therefore, the lead emission limit for the three-process operation facility is considered achievable.

Economic Impact

One commenter contended that new source performance standards would impose a substantial and burdensome cost on the lead-acid battery manufacturing industry. Another stated that battery sales have fallen by 25 percent in recent years.

The economic impacts of new source performance standards on the lead-acid battery manufacturing industry are analyzed and described in detail in Volumes I and II of the BID. These impacts are summarized in the section of this preamble entitled "SUMMARY OF ENVIRONMENTAL, ENERGY, AND ECONOMIC IMPACTS." The projected economic impacts are considered reasonable. The expected annualized cost of compliance with the promulgated standards at a typical affected plant is expected to be about 1.6 percent of the wholesale price of a battery; and the economic impact analysis indicates that this cost could be passed on with little effect on sales.

The promulgated standards are new source performance standards and will only affect new, modified, and reconstructed facilities. Existing facilities are not covered by the standards. The 25 percent drop in sales cited by the second commenter results from the recent decline in the production of domestic automobiles. The low sales, if they continue, would reduce growth in the production capacity of the industry. Hence, the number of new, modified, and reconstructed facilities would be reduced. Since the standards will affect only these facilities, the low sales should not increase the economic impact

of the standards on the industry as a whole or on individual plants.

Several commenters contended that the cost of compliance with OSHA standards was not adequately addressed in Volume I of the BID. The commenters also felt that the OSHA standards would require higher ventilation rates than are currently needed, and would thus cause the costs of compliance with new source performance standards to be higher than the estimates made by EPA.

The OSHA compliance costs presented in Volume I are based on the capital and operating cost of controls which were expected to be required to meet the employee exposure standards of $200 \mu\text{g}/\text{m}^3$ originally proposed by OSHA in 1975. The controls include employee care, general plant maintenance, and local ventilation of in-plant lead emission sources. On November 14, 1978, OSHA promulgated an employee exposure standard of $50 \mu\text{g}/\text{m}^3$. However, the controls necessary to comply with this standard are expected to be similar to those which would have been necessary for the originally proposed $200 \mu\text{g}/\text{m}^3$ standard. In addition, the economic impact projected for the OSHA standards in Volume I may be higher than the actual economic impact, because, in a number of cases, work practices may be used to achieve the OSHA standard in place of technological controls.

In volume I of the BID, the statement is made that a change in the OSHA standards could cause the control costs for the new source performance standards to increase substantially. However, in light of data obtained in recent investigations and discussed in Volume II of the BID, it is not expected that the change in OSHA standards will have a significant effect on the results of the economic impact analysis for the NSPS. The facility exhaust rates used to project the economic impacts of the NSPS were not based on the exhaust rates of facilities tested by EPA but were set at levels which would provide good ventilation for the facilities under consideration. These exhaust rates are higher than those which were used at typical lead-acid battery plants before the change in the OSHA standard, and are thought to be sufficient for compliance with the $50 \mu\text{g}/\text{m}^3$ OSHA standard.

Environmental Impact

A number of commenters contended that, because lead-acid battery manufacturer accounts for a small percentage of total nationwide lead emissions, new source performance standards should not be set for this

source category. One commenter cited data which indicate that lead emissions from lead-acid battery manufacturer accounted for only about 0.32 percent of industrial lead emissions or about 0.014 percent of total nationwide lead emissions in 1975.

It is acknowledged that lead-acid battery plants account for a relatively small share of total nationwide atmospheric lead emissions. In 1975, about 95 percent of U.S. lead emissions resulted from the production of alkyl lead gasoline additive, the burning of leaded gasoline, and the disposal of crankcase oil from vehicles which burn leaded gasoline. These emissions will be reduced substantially as the use of alkyl lead gasoline additives is curtailed. Another 1 percent of nationwide lead emissions is from mining and smelting operations, which are generally located in remote areas. However, lead-acid battery plants are generally located in urban areas, near the markets for their batteries. Ambient lead levels are already high in many of these places, often exceeding the NAAQS for lead. In light of the dangerous levels of lead in the ambient air surrounding many of the projected sites for new, modified, and reconstructed facilities, the Agency believes that additional emissions from lead-acid battery manufacture are significant. As a result, lead emissions from aggregated lead-acid battery manufacture, though smaller than emissions from some of the other sources, do contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. Therefore, the Administrator considers the development of new source performance standards for this industry to be justified.

Several commenters recommended that the grid casting facility be removed from the list of affected facilities. According to EPA estimates, grid casting accounts for about 3.2 percent of overall uncontrolled battery plant lead emissions. The commenters stated that it is unreasonable to require sources to control facilities generating such a small percentage of total plant emissions.

Lead-acid battery plants are major lead emitters, and EPA dispersion calculations show that the ambient lead standard could be exceeded in the area around a plant which controls emissions to the extent required to meet typical SIP particulate regulations. Grid casting, while accounting for only about 5 percent of emissions for a plant with such controls, can be controlled with lead reclamation by available technology at a cost which is similar to the cost of controlling larger sources in

the plant. Of the 30¢ per battery cost impact of the standards for a typical plant, approximately 4¢ per battery can be attributed to grid casting control. Therefore, grid casting emissions are regulated under the promulgated standards.

Legal Considerations

Several commenters stated that, because a national ambient air quality standard for lead has been established, new source performance standards regulating lead emissions would be redundant and unnecessary.

It should be noted that the purposes of standards of performance for new sources promulgated under Section 111 of the Clean Air Act differ from the purposes of national ambient air quality standards, which are promulgated under Section 109 of the Act. National ambient air quality standards establish ambient pollutant concentration target ceilings which are to be attained and maintained for the protection of the public health or welfare.

New source performance standards promulgated under Section 111 of the Clean Air Act are not designed to achieve any specific air quality levels. Congress clearly intended that new source performance standards regulate Section 108 pollutants in addition to other air pollutants, since a key purpose of Section 111 is to establish nationally applicable emission limits for new sources, thus preventing any state from attracting industry by adopting lenient environmental standards. Congress expressed a number of other reasons for requiring the setting of new source performance standards. Because the national ambient air quality standards create air quality ceilings which are not to be exceeded, new source performance standards enhance the potential for long term growth. Also, new source performance standards may help achieve long-term cost savings by avoiding the need for expensive retrofitting when pollution ceilings may be reduced in the future. Finally, the standard-setting process should create incentives for improved technology. Therefore, because the purposes of ambient air quality standards are different from the purposes of new source performance standards, promulgation of an NSPS to control emissions from lead-acid battery plants of a pollutant for which there exists an NAAQS is neither redundant nor unnecessary.

Test Methods and Monitoring

Reference Method 12—A number of commenters felt that Reference Method 12 was cumbersome and recommended

the development of a simpler screening method. The commenters stated that a battery plant may have as many as two dozen stacks and that, at an average cost of \$6000 per stack test, the cost of testing an entire plant could be extremely high.

Because controlled emission levels for most facilities are expected to be near the emission limits for facilities affected by the regulation, a screening method less accurate than Method 12 would generally not be suitable for determining compliance with the lead-acid battery manufacture regulation. The cost of compliance testing using Method 12 was discussed in the BID for the proposed standards and is considered reasonable. For plants where a number of stacks must be tested, the per plant costs of conducting performance tests using Method 12 are not expected to be as high as the commenters anticipated. Although existing plants often have a large number of stacks, it is expected that for newly constructed, modified, or reconstructed plants or facilities emissions will be ducted to a small number of stacks. The estimate of \$6,000 per stack for a compliance test applies only for plants where a small number of stacks are to be tested. For plants with a large number of stacks, the cost per stack could decrease significantly. In addition, the general provisions applicable to all new source performance standards allow for the use of an alternative method where the Administrator determines that the results would be adequate for indicating whether a specific source is in compliance (40 CFR 60.8(b)).

One commenter recommended that the minimum sampling time for Method 12 be extended. Another stated that the minimum sampling time for grid casting in the proposed regulation was too long.

For tests with Method 12, the minimum amount of lead needed for good sample recovery and analysis is 100 µg. The minimum sampling rates and times insure that enough lead will be collected. For grid casting, the minimum sampling time has been changed from 180 minutes, in the proposed regulation, to 60 minutes, in the promulgated action. The change reflects the alteration in the standard for grid casting.

Reference Method 9—Two commenters expressed concern that Method 9 is not accurate enough to be used to enforce a standard of 0 percent opacity. One commenter stated that it is difficult to discern the difference between 0 percent opacity and 1 percent opacity for a given reading.

No single reading is made to the nearest percent; rather, readings are to

be recorded to the nearest 5 percent opacity and averaged over a period of 6 minutes (24 readings). For this regulation, the 6-minute average opacity figure is to be rounded to the nearest whole number. The opacity standard for lead-acid battery manufacture is based on opacity data taken for operating facilities.

Reporting and Recordkeeping

A number of commenters contended that the proposed pressure drop monitoring and recording requirement for control systems would not serve to insure proper operation and maintenance of fabric filters. The commenters pointed out that a leak in a fabric filter would not result in a measurable difference in the pressure drop across the filter. One commenter suggested that the pressure drop monitoring requirement be replaced by an opacity monitoring requirement. Another commenter suggested that the pressure drop requirement be replaced by a requirement of visible inspection of bags for leaks.

Based on the arguments presented by these commenters, it is agreed that proposed pressure monitoring requirement for fabric filters would not serve its intended purpose. This requirement has been eliminated. However, pressure drop is considered to be a good indicator of proper operation and maintenance for scrubbers. Therefore the pressure drop monitoring and recording requirement for scrubbers has been retained.

The pressure drop monitoring requirement for fabric filters has not been replaced by another monitoring requirement. The cost of opacity monitoring equipment may in some cases be comparable to the cost of emission control systems for lead-acid battery manufacturing facilities. This cost is considered unreasonable. Although periodic visual inspection of bags would provide an indication of bag integrity, visual inspection records would not be useful to the EPA in the enforcement of the promulgated standards.

A number of commenters stated that while pressure drop monitoring is useful for scrubbers, continuous recording of pressure drop would be unnecessary and expensive. Some commenters questioned whether a device which cyclically monitors the pressure drop across several emission control systems would be considered a continuous recorder for the systems. These commenters also asked how often such a recorder would have to monitor the pressure drop across a particular control

device to be considered a continuous recorder for that device. One commenter suggested the substitution of periodic manual recording of pressure drop for the continuous pressure drop recording requirement. Another commenter questioned the purpose of requiring pressure drop monitoring and recording without a requirement that action be taken at certain pressure drop levels.

The purpose of pressure drop recording requirements is to allow the verification by EPA that emission control systems are properly operated and maintained. The costs of pressure drop recording devices were analyzed and are considered reasonable. The sort of device that would satisfy the recording requirement has been clarified in the promulgated standards. It has been determined that for the purposes of these standards a device which records pressure drop at least every 15 minutes would accomplish the same purposes as a continuous pressure drop recorder. Manual pressure drop recording would not insure proper operation and maintenance of a control system.

Other Considerations

A number of commenters recommended that the definition of the paste mixing facility be expanded to include operations ancillary to paste mixing, such as lead oxide storage, conveying, weighing, and metering operations; paste handling and cooling operations; and plate pasting, takeoff, cooling, and drying operations. The commenters stated that paste mixing and operations ancillary to the paste mixing operation are generally interdependent, in that one operation is not run without the others. Also, emissions from paste mixing and ancillary operations are often ducted to the same control device. The commenters were concerned that a minor change made to a paste mixing machine could cause the machine to be affected by the promulgated standards under the reconstruction provisions applicable to all new source performance standards. They stated that the recommended change would avoid this possibility.

These comments are considered reasonable. The operations ancillary to paste mixing were not intended to be considered separate facilities; and the definition recommended by the commenters for the paste mixing facility is considered an appropriate definition. Therefore, the recommendation of the commenters has been adopted in the promulgated regulation. Because the emission limit which was proposed for paste mixing is identical to that which was proposed for operations ancillary to

paste mixing ("other lead-emitting operations"), this change is not expected to affect the environmental impacts of the standards.

Docket

The docket is an organized and complete file of all the information considered by EPA in the development of this rulemaking. The docket is a dynamic file, since material is added throughout the rulemaking development. The docketing system is intended to allow members of the public and industries involved to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process. Along with the statement of basis and purpose of the promulgated standards and EPA responses to significant comments, the contents of the docket will serve as the record in case of judicial review (Section 307(d)(7)(A)).

Miscellaneous

The effective date of this regulation is April 16, 1982. Section 111 of the Clean Air Act provides that standards of performance or revisions thereof become effective upon promulgation and apply to affected facilities, construction or modification of which was commenced after the date of proposal (January 14, 1980).

As prescribed by Section 111, the promulgation of these standards was preceded by the Administrator's determination (40 CFR 60.16, 44 FR 49222, August 21, 1979) that these sources contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare and by proposal of the standards on January 14, 1980 (45 FR 2790). In accordance with Section 117 of the Act, publication of these promulgated standards was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies.

It should be noted that standards of performance for new sources established under Section 111 of the Clean Air Act reflect:

* * * 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 (Section 111(a)(1)).

Although there may be emission control technology available that can reduce emissions below those levels required to comply with standards of performance, this technology might not be selected as the basis of standards of

performance because of costs associated with its use. Accordingly, standards of performance should not be viewed as the ultimate in achievable emission control. In fact, the Act requires (or has the potential for requiring) the imposition of a more stringent emission standard in several situations.

For example, applicable costs do not necessarily play as prominent a role in determining the "lowest achievable emissions rate" for new or modified sources located in nonattainment areas, i.e., those areas where statutorily mandated health and welfare standards are being violated. In this respect, Section 173 of the Act requires that a new or modified source constructed in an area which exceeds the National Ambient Air Quality Standard (NAAQS) must reduce emissions to the level which reflects the "lowest achievable emission rate" (LAER), as defined in Section 171(3), for such category of source. The statute defines LAER as that rate of emission which reflects:

(A) The most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable, or

(B) The most stringent emission limitation which is achieved in practice by such class or category of source, whichever is more stringent.

In no event can the emission rate exceed any applicable new source performance standard (Sec. 171(3)).

A similar situation may arise under the prevention of significant deterioration of air quality provisions of the Act (Part C). These provisions require that certain sources (referred to in Section 169(1)) employ "best available control technology" (as defined in Section 169(3)) for all pollutants regulated under the Act. Best available control technology (BACT) must be determined on a case-by-case basis, taking energy, environmental and economic impacts, and other costs into account. In no event may the application of BACT result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to Section 111 (or 112) of the Act.

In any event, State implementation plans (SIPs) approved or promulgated under Section 110 of the Act must provide for the attainment and maintenance of National Ambient Air Quality Standards designed to protect public health and welfare. For this purpose, SIPs must in some cases require greater emission reductions than

those required by standards of performance for new sources.

Finally, States are free under Section 116 of the Act to establish even more stringent emission limits than those established under Section 111 or those necessary to attain or maintain the NAAQS under Section 110. Accordingly, new sources may in some cases be subject to limitations more stringent than EPA's standards of performance under Section 111, and prospective owners and operators of new sources should be aware of this possibility in planning for such facilities.

This regulation will be reviewed 4 years from the date of promulgation as required by the Clean Air Act. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements in emission control technology, and reporting requirements. The reporting requirements in the regulation will be reviewed as required under EPA's sunset policy for reporting requirements in regulations.

Under Executive Order 12291, EPA must judge whether a regulation is "Major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not Major because: (1) The national annualized compliance costs, including capital charges resulting from the standards total less than \$100 million; (2) the standards do not cause a major increase in prices or production costs; and (3) the standards do not cause significant adverse effects on domestic competition, employment, investment, productivity, innovation or competition in foreign markets. This regulation was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291.

Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment for any new source standard of performance promulgated under Section 111(b) of the Act. An economic impact assessment was prepared for the promulgated regulations and for other regulatory alternatives. All aspects of the assessment were considered in the formulation of the promulgated standards to insure that the standards would represent the best system of emission reduction considering costs. The economic impact assessment is included in the background information document.

List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium sulfate plants, Cement industry, Coal, Copper, Electric power-

plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Sewage disposal, Steel, Sulfuric acid plants, Waste treatment and disposal, Zinc.

Dated: April 9, 1982.

Note.—The regulation does not involve a "collection of information" as defined under the Paperwork Reduction Act of 1980. Therefore, the provisions of the Paperwork Reduction Act applicable to collections of information do not apply to this regulation.

Anne M. Gorsuch,
Administrator.

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

40 CFR Part 60 is amended by adding a new Subpart KK and by adding a new reference method to Appendix A as follows:

1. A new subpart is added as follows:

Subpart KK—Standards of Performance for Lead-Acid Battery Manufacturing Plants

Sec.

60.370 Applicability and designation of affected facility.

60.371 Definitions.

60.372 Standards for lead.

60.373 Monitoring of emissions and operations.

60.374 Test methods and procedures.

Authority: Sec. 111, 301(a) of the Clean Air Act as amended (42 U.S.C. 7411, 7601(a)), and additional authority as noted below.

Subpart KK—Standards of Performance for Lead-Acid Battery Manufacturing Plants

§ 60.370 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to the affected facilities listed in paragraph (b) of this section at any lead-acid battery manufacturing plant that produces or has the design capacity to produce in one day (24 hours) batteries containing an amount of lead equal to or greater than 5.9 Mg (6.5 tons).

(b) The provisions of this subpart are applicable to the following affected facilities used in the manufacture of lead-acid storage batteries:

- (1) Grid casting facility.
- (2) Paste mixing facility.
- (3) Three-process operation facility.
- (4) Lead oxide manufacturing facility.
- (5) Lead reclamation facility.
- (6) Other lead-emitting operations.

(c) Any facility under paragraph (b) of this section the construction or modification of which is commenced

after January 14, 1980, is subject to the requirements of this subpart.

§ 60.371 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) "Grid casting facility" means the facility which includes all lead melting pots and machines used for casting the grid used in battery manufacturing.

(b) "Lead-acid battery manufacturing plant" means any plant that produces a storage battery using lead and lead compounds for the plates and sulfuric acid for the electrolyte.

(c) "Lead oxide manufacturing facility" means a facility that produces lead oxide from lead, including product recovery.

(d) "Lead reclamation facility" means the facility that remelts lead scrap and casts it into lead ingots for use in the battery manufacturing process, and which is not a furnace affected under Subpart L of this part.

(e) "Other lead-emitting operation" means any lead-acid battery manufacturing plant operation from which lead emissions are collected and ducted to the atmosphere and which is not part of a grid casting, lead oxide manufacturing, lead reclamation, paste mixing, or three-process operation facility, or a furnace affected under Subpart L of this part.

(f) "Paste mixing facility" means the facility including lead oxide storage, conveying, weighing, metering, and charging operations; paste blending, handling, and cooling operations; and plate pasting, takeoff, cooling, and drying operations.

(g) "Three-process operation facility" means the facility including those processes involved with plate stacking, burning or strap casting, and assembly of elements into the battery case.

§ 60.372 Standards for lead.

(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:

(1) From any grid casting facility any gases that contain lead in excess of 0.40 milligram of lead per dry standard cubic meter of exhaust (0.000176 gr/dscf).

(2) From any paste mixing facility any gases that contain in excess of 1.00 milligram of lead per dry standard cubic meter of exhaust (0.00044 gr/dscf).

(3) From any three-process operation facility any gases that contain in excess of 1.00 milligram of lead per dry

standard cubic meter of exhaust (0.00044 gr/dscf).

(4) From any lead oxide manufacturing facility any gases that contain in excess of 5.0 milligrams of lead per kilogram of lead feed (0.010 lb/ton).

(5) From any lead reclamation facility any gases that contain in excess of 4.50 milligrams of lead per dry standard cubic meter of exhaust (0.00198 gr/dscf).

(6) From any other lead-emitting operation any gases that contain in excess of 1.00 milligram per dry standard cubic meter of exhaust (0.00044 gr/dscf).

(7) From any affected facility other than a lead reclamation facility any gases with greater than 0 percent opacity (measured according to Method 9 and rounded to the nearest whole percentage).

(8) From any lead reclamation facility any gases with greater than 5 percent opacity (measured according to Method 9 and rounded to the nearest whole percentage).

(b) When two or more facilities at the same plant (except the lead oxide manufacturing facility) are ducted to a common control device, an equivalent standard for the total exhaust from the commonly controlled facilities shall be determined as follows:

$$S_e = \sum_{a=1}^N S_a(Q_{sd_a}/Q_{sd_t})$$

Where:
 S_e = is the equivalent standard for the total exhaust stream.
 S_a = is the actual standard for each exhaust stream ducted to the control device.
 N = is the total number of exhaust streams ducted to the control device.
 Q_{sd_a} = is the dry standard volumetric flow rate of the effluent gas stream from each facility ducted to the control device.
 Q_{sd_t} = is the total dry standard volumetric flow rate of all effluent gas streams ducted to the control device.

§ 60.373 Monitoring of emissions and operations.

The owner or operator of any lead-acid battery manufacturing facility subject to the provisions of this subpart and controlled by a scrubbing system(s) shall install, calibrate, maintain, and operate a monitoring device(s) that measures and records the pressure drop across the scrubbing system(s) at least once every 15 minutes. The monitoring device shall have an accuracy of ±5 percent over its operating range.

(Sec. 114 of the Clean Air Act as amended (42 U.S.C. 7414))

§ 60.374 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided under § 60.8(b), shall be used to determine compliance according to § 60.8 as follows:

- (1) Method 12 for the measurement of lead concentrations,
- (2) Method 1 for sample and velocity traverses,
- (3) Method 2 for velocity and volumetric flow rate, and
- (4) Method 4 for stack gas moisture.

(b) For Method 12, the sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.85 dscm/h (0.53 dscf/min), except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) When different operations in a three-process operation facility are ducted to separate control devices, the lead emission concentration from the facility shall be determined using the equation:

$$C_{pbt} = \sum_{a=1}^N (C_{pba} Q_{sd_a} / Q_{sd_t})$$

Where:
 C_{pbt} = is the facility emission concentration for the entire facility.
 N = is the number of control devices to which separate operations in the facility are ducted.
 C_{pba} = is the emission concentration from each control device.
 Q_{sd_a} = is the dry standards volumetric flow rate of the effluent gas stream from each control device.
 Q_{sd_t} = is the total dry standard volumetric flow rate from all of the control devices.

(d) For lead oxide manufacturing facilities, the average lead feed rate to a facility, expressed in kilograms per hour, shall be determined for each test run as follows:

(1) Calculate the total amount of lead charged to the facility during the run by multiplying the number of lead pigs (ingots) charged during the run by the average mass of a pig in kilograms or by another suitable method.

(2) Divide the total amount of lead charged to the facility during the run by the duration of the run in hours.

(e) Lead emissions from lead oxide manufacturing facilities, expressed in milligrams per kilogram of lead charged, shall be determined using the following equation:

$$E_{pb} = C_{pb} Q_{sd} / F$$

Where:
 E_{pb} = is the lead emission rate from the facility in milligrams per kilogram of lead charged.

C_{pb} = is the concentration of lead in the exhaust stream in milligrams per dry standard cubic meter as determined according to paragraph (a)(1) of this section.

Q_{sd} = is the dry standard volumetric flow rate in dry standard cubic meters per hour as determined according to paragraph (a)(3) of this section.

F = is the lead feed rate to the facility in kilograms per hour as determined according to paragraph (d) of this section.

(Sec. 114 of the Clean Air Act as amended (42 U.S.C. 7414))

2. Appendix A to Part 60 is amended by adding new Reference Method 12 as follows:

Appendix A—Reference Methods

* * * * *

Method 12. Determination of Inorganic Lead Emissions From Stationary Sources

1. Applicability and Principle.

1.1 Applicability. This method applies to the determination of inorganic lead (Pb) emissions from specified stationary sources only.

1.2 Principle. Particulate and gaseous Pb emissions are withdrawn isokinetically from the source and collected on a filter and in dilute nitric acid. The collected samples are digested in acid solution and analyzed by atomic absorption spectrometry using an air acetylene flame.

2. Range, Sensitivity, Precision, and Interferences.

2.1 Range. For a minimum analytical accuracy of ±10 percent, the lower limit of the range is 100 µg. The upper limit can be considerably extended by dilution.

2.2 Analytical Sensitivity. Typical sensitivities for a 1-percent change in absorption (0.0044 absorbance units) are 0.2 and 0.5 µg Pb/ml for the 217.0 and 283.3 nm lines, respectively.

2.3 Precision. The within-laboratory precision, as measured by the coefficient of variation ranges from 0.2 to 9.5 percent relative to a run-mean concentration. These values were based on tests conducted at a gray iron foundry, a lead storage battery manufacturing plant, a secondary lead smelter, and a lead recovery furnace of an alkyl lead manufacturing plant. The concentrations encountered during these tests ranged from 0.61 to 123.3 mg Pb/m³.

2.4 Interferences. Sample matrix effects may interfere with the analysis for Pb by flame atomic absorption. If this interference is suspected, the analyst may confirm the presence of these matrix effects and frequently eliminate the interference by using the Method of Standard Additions.

High concentrations of copper may interfere with the analysis of Pb at 217.0 nm. This interference can be avoided by analyzing the samples at 283.3 nm.

3. Apparatus.

3.1 Sampling Train. A schematic of the sampling train is shown in Figure 12-1; it is similar to the Method 5 train. The sampling train consists of the following components:

3.1.1 Probe Nozzle, Probe Liner, Pitot Tube, Differential Pressure Gauge, Filter Holder, Filter Heating System, Metering System, Barometer, and Gas Density Determination Equipment. Same as Method 5, Sections 2.1.1 to 2.1.6 and 2.1.8 to 2.1.10, respectively.

3.1.2 Impingers. Four impingers connected in series with leak-free ground glass fittings or any similar leak-free noncontaminating fittings. For the first, third, and fourth impingers, use the Greenburg-Smith design, modified by replacing the tip with a 1.3 cm (½ in.) ID glass tube extending to about 1.3 cm (½ in.) from the bottom of the flask. For the second impinger, use the Greenburg-Smith design with the standard tip. Place a thermometer, capable of measuring temperature to within 1°C (2°F) at the outlet of the fourth impinger for monitoring purposes.

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