United States
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Industrial Environmental Research
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Research Triangle Park NC 27711

JUL 79

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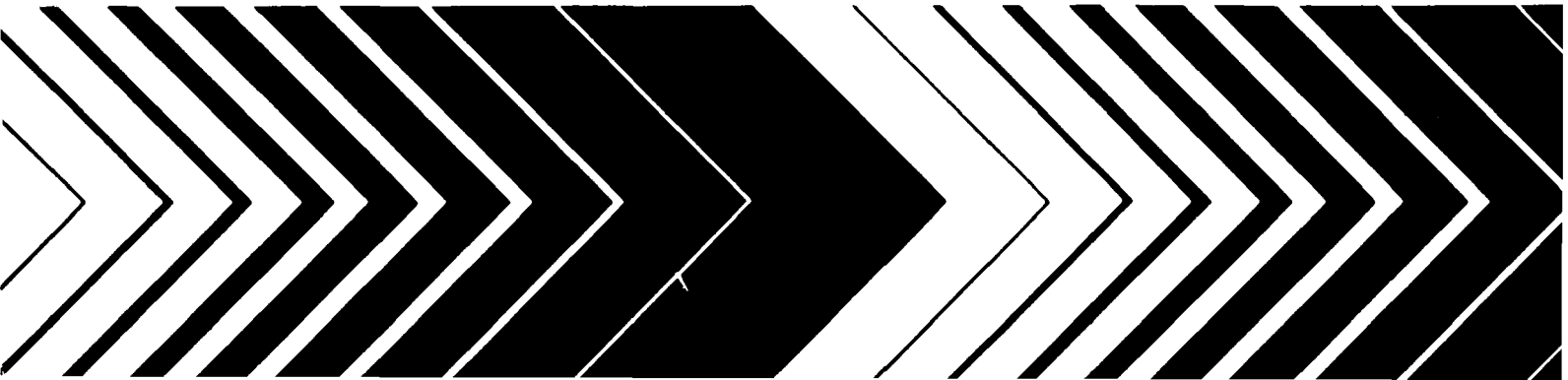
Report Abstracts

Industrial Environmental Research Laboratory RTP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Industrial Environmental Research Laboratory
Research Triangle Park, North Carolina 27711
July 1979

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

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/2-79-025		

4. TITLE AND SUBTITLE	5. REPORT DATE
A Cost Study Format for BATEA Achievement by the Iron and Steel Industry	January 1979
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
L. L. Huff and J. D. Stockham	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
IIT Research Institute 10 West 35th Street Chicago, Illinois 60616	1BB610
	11. CONTRACT/GRANT NO. 68-02-2617, Task 2-4

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Task Final; 8/77 - 1/78
	14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is John S. Ruppersberger, Mail Drop 62, 919/541-2733.

16. ABSTRACT The report describes a study to develop a format for Best Available Technology Economically Achievable (BATEA) cost analysis, including pertinent cost data. The format is to aid Regional U.S. EPA personnel in evaluating economic appeal cases for BATEA. Through discussion with U.S. EPA Regional personnel and a review of cost engineering literature, two sample formats were developed: one for capital investment; the other for operating costs. The cost analysis formats were designed specifically for application to the iron and steel industry; although, with modification, they could be used for other industries as well. General information regarding various cost components is provided as a basis for analyzing cost estimates presented by specific iron and steel plants.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Iron and Steel Industry	Stationary Sources	11F
Cost Analysis	BATEA	14A
Cost Engineering		
Capitalized Costs		05A
Operating Costs		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA-600/2-79-112	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Level 1 Assessment of Uncontrolled Sinter Plant Emissions		5. REPORT DATE May 1979 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) C.W. Westbrook		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Research Triangle Institute P.O. Box 12194 Research Triangle Park, North Carolina 27709		10. PROGRAM ELEMENT NO. 1AB604C and 1BB610C 11. CONTRACT/GRANT NO. 68-02-2630, Task 3
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 3/78 - 3/79 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Robert V. Hendriks, Mail Drop 62, 919/541-2733.

16. ABSTRACT The report gives results of sampling and analysis of uncontrolled emissions from two sinter plants, to characterize and quantify the particulate, organic, and inorganic species present. One plant used revert (waste products of other steelmaking operations) material (series 1); the other did not (series 2). In both plants, sampling took place in the windbox gas main before the emission control equipment, using EPA Level 1 environmental assessment methodology. Samples from the sinter plant not using revert material were delayed in shipment for 2 months and, therefore, received a reduced analytical effort. Particulate concentrations of 1405 and 804 mg/cu m and total organic emissions of 25.66 and 4/84 mg/cu m were found for series 1 and 2, respectively. No known carcinogenic organic compounds were identified. Organics in both cases were largely high molecular weight materials. For series 1, concentrations of the different organic categories were in the same relative proportion as in the process feed sample, despite the fact that about 85% of the feed organic was destroyed. Analyses indicate that 12 inorganic components and 5 organic categories might exceed Air-Health MATE values if emitted uncontrolled.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Dust Sintering Iron and Steel Industry Emission Assessments Analyzing	Pollution Control Stationary Sources Particulate	13B 11G 13H 11F 14B

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report)	21. NO. OF PAGES
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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-78-110		

4. TITLE AND SUBTITLE	5. REPORT DATE
Electrostatic Precipitator Technology Assessment: Visits in Japan, November 1977	June 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Grady B. Nichols	Project 3858-5
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Southern Research Institute 2000 Ninth Avenue, South Birmingham, Alabama 35205	EHE624
	11. CONTRACT/GRANT NO.
	68-02-2610, W.A. 5
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Final; 11/77-4/78
	14. SPONSORING AGENCY CODE
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15. SUPPLEMENTARY NOTES IERL-RTP project officer is James H. Abbott, Mail Drop 61, 919/541-2925.

16. ABSTRACT The report gives results of a particulate control technology assessment visit to Japan by a team of U.S. investigators. The visit included discussions with personnel from universities, industries, and other major installations involved with particulate control. Significant research activities were noted in both the academic and industrial sectors related to particulate control and measurements. The report summarizes results of the individual discussions, observations during the tour, and discussions of technical papers. Many valuable technical papers supplied to the U.S. team are reproduced the the Appendix of the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution	Air Pollution Control	13B
Electrostatic Precipitation	Stationary Sources	13H
Dust	Japan	11G
Measurement	Particulates	14B

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-78-110a		

4. TITLE AND SUBTITLE	5. REPORT DATE
Electrostatic Precipitator Technology Assessment: Visits in Japan, November 1977	June 1978
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Grady B. Nichols	Project 3858-5

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Southern Research Institute 2000 Ninth Avenue, South Birmingham, Alabama 35205	EHE624
	11. CONTRACT/GRANT NO.
	68-02-2610, W.A. 5

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Final; 11/77-4/78
	14. SPONSORING AGENCY CODE
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15. SUPPLEMENTARY NOTES IERL-RTP project officer is James H. Abbott, Mail Drop 61, 919/541-2925. EPA-600/7-78-110 is the basic report.

16. ABSTRACT The report gives results of a particulate control technology assessment visit to Japan by a team of U.S. investigators. The visit included discussions with personnel from universities, industries, and other major installations involved with particulate control. Significant research activities were noted in both the academic and industrial sectors related to particulate control and measurements. The report summarizes results of the individual discussions, observations during the tour, and discussions of technical papers. Many valuable technical papers supplied to the U.S. team are reproduced the the Appendix of the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution	Air Pollution Control	13B
Electrostatic Precipitation	Stationary Sources	13H
Dust	Japan	11G
Measurement	Particulates	14B

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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TECHNICAL REPORT DATA *(Please read Instructions on the reverse before completing)*		
1. REPORT NO. EPA-600/7-79-043c	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Fabric Filter Model Sensitivity Analysis		5. REPORT DATE April 1979 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Richard Dennis, H.A.Klemm, and William Battye		8. PERFORMING ORGANIZATION REPORT NO. GCA-TR-78-26-G
9. PERFORMING ORGANIZATION NAME AND ADDRESS GCA/Technology Division Burlington Road Bedford, Massachusetts 01730		10. PROGRAM ELEMENT NO. EHE624 11. CONTRACT/GRANT NO. 68-02-2607, Task 7
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 6/78 - 2/79 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is James H. Turner, MD-61, 919/541-2925.

16. ABSTRACT The report gives results of a series of sensitivity tests of a GCA fabric filter model, as a precursor to further laboratory and/or field tests. Preliminary tests had shown good agreement with field data. However, the apparent agreement between predicted and actual values was based on limited comparisons: validation was carried out without regard to optimization of the data inputs selected by the filter users or manufacturers. The sensitivity tests involved introducing into the model several hypothetical data inputs that reflect the expected ranges in the principal filter system variables. Such factors as air/cloth ratio, cleaning frequency, amount of cleaning, specific resistence coefficient K2, the number of compartments, and inlet concentration were examined in various permutations. A key objective of the tests was to determine the variables that require the greatest accuracy in estimation based on their overall impact on model output. For K2 variations, the system resistance and emission properties showed little change; but the cleaning requirement changed drastically. On the other hand, considerable difference in outlet dust concentration was indicated when the degree of fabric cleaning was varied. To make the findings more useful to persons assessing the probable success of proposed or existing filter systems, much of the data output is presented in graphs or charts.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Filtration	Stationary Sources	07D
Fabrics	Fabric Filters	11E
Mathematical Models	Bag Houses	12A
Sensitivity		14B
Analyzing		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA-600/7-79-063a	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE APPROACH TO LEVEL 2 ANALYSIS BASED ON LEVEL 1 RESULTS, MEG CATEGORIES AND COMPOUNDS, AND DECISION CRITERIA		5. REPORT DATE February 1979 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) L.E. Ryan, R.G. Beimer, and R.F. Maddalone		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TRW, Inc. Defense and Space Systems Group One Space Park Redondo Beach, California 90278		10. PROGRAM ELEMENT NO. EHE623A 11. CONTRACT/GRANT NO. 68-02-2613, Task 6
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 12/76 - 12/78 14. SPONSORING AGENCY CODE EPA/600/13
15. SUPPLEMENTARY NOTES IERL-RTP project officer is Walter B. Steen, MD-61, 919/541-2825.		

16. ABSTRACT The report describes an approach to the decision criteria needed to proceed from the initial emission screening analysis (Level 1) to the detailed emission characterization (Level 2), and a Level 2 analytical approach. The decision criteria, considering only the available Level 1 chemical data, provide a basis which can be used for proceeding to a Level 2 emission characterization based on chemical correlation with compounds identified as Multimedia Environmental Goals (MEGs). The report discusses the types of Level 1 environmental assessment samples, and the chemical data available which can be prioritized for a MEG-based Level 2 plan. It presents a logic network for determining the need for a Level 2 sampling effort. It also presents an integrated approach to Level 2 inorganic compound analysis, an identification scheme consisting of characterization of the initial sample, of bulk composition, and of individual particles. Detailed logic networks are included to provide direction to the analyst during the identification process. The analysis of solid and liquid samples for organic compounds is discussed, using mainly combined gas chromatography/mass spectrometry. A logic network is provided for the organic analyst.

17. KEY WORDS AND DOCUMENT ANALYSIS			
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Assessments Analyzing Sampling Organic Compounds Inorganic Compounds	Gas Chromatography Mass Spectroscopy	Pollution Control Stationary Sources Environmental Assessment Level 2 Analysis MEGs	13B 14B 07D 07C 0702
18. DISTRIBUTION STATEMENT Unlimited		19. SECURITY CLASS (This Report) Unclassified 20. SECURITY CLASS (This page) Unclassified	21. NO. OF PAGES 163 22. PRICE

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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-79-067b		

4. TITLE AND SUBTITLE	5. REPORT DATE
EPA INDUSTRIAL BOILER FGD SURVEY: First Quarter 1979	April 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J. Tuttle, A. Patkar, S. Kothari, D. Osterhout, M. Heffling, and M. Eckstein	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS PEDCo Environmental, Inc. 11499 Chester Road Cincinnati, OH 45246	10. PROGRAM ELEMENT NO. EHE624
	11. CONTRACT/GRANT NO. 68-02-2603, Task 45
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	13. TYPE OF REPORT AND PERIOD COVERED Task Final; 1-3/79
	14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer R. M. McAdams is no longer with EPA; for details contact R. D. Stern, MD-61, 919/541-2915. Earlier related reports are in the EPA-600/7-78-052 series.

16. ABSTRACT The report gives detailed technical information concerning application of flue gas desulfurization (FGD) systems to industrial boilers. Design and operation data is presented for 164 FGD control systems (125 of them operational), designed to control SO2 emissions from 304 industrial boilers at 58 plants. With a 1978 capacity of 8.8 million scfm, an average of more than seven new FGD systems have been put on line each year since 1972. Information in the report was obtained by a survey of plant personnel, control system vendors, regulatory agencies, and consulting engineering firms. The data is given in two types of tables: one gives summary information; the other, detailed information. Summary tables present information as a function of control process, control system vendor, disposal technique, operational status, startup date, and flue gas capacity. Detailed information includes: control system design, economics, operating experience, problems and solutions, waste disposal techniques, and maintenance practices.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Flue Gases Desulfurization Boilers Waste Disposal Maintenance Pulping Chemical Industry	Pollution Control Stationary Sources Industrial Boilers	13B 11H 21B 07A, 07D 13A 15E

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-79-069		

4. TITLE AND SUBTITLE	5. REPORT DATE
Economics of Disposal of Lime/Limestone Scrubbing Wastes: Sludge/Flyash Blending and Gypsum Systems	February 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
J.W. Barrier, H.L. Faucett, and L.J. Henson	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
TVA, Office of Agricultural and Chemical Development National Fertilizer Development Center Muscle Shoals, Alabama 35660	INE624A
	11. CONTRACT/GRANT NO.
	EPA-IAG-D8-E721-BI
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Final; 6/77 - 5/78
	14. SPONSORING AGENCY CODE
	EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Julian W. Jones, MD-61, 919-541-2489. EPA-600/7-78-023a is an earlier related report.

16. ABSTRACT The report, the second in a series of economic evaluations of flue gas desulfurization (FGD) waste disposal systems, gives results of a study of two processes that produce a soil-like landfill material without using purchased additives: (1) separately collected flyash is blended with dewatered FGD sludge from a limestone scrubbing system; and (2) air-oxidation modifications to a limestone scrubber, which also collects the flyash, produce a high-sulfate sludge (gypsum) which is dewatered and discarded without further treatment. Both processes are being developed: neither has been fully demonstrated. The sludge/flyash blending process had a higher capital investment ($36.40/kW) than the other (as well as untreated ponding and three of four chemical processes evaluated in an ealier study) primarily because of high electrostatic precipitator and process equipment costs; however, the process had lower annual revenue requirements (1.64 mills/kWh) than three of the four chemical processes. The gypsum process had the lowest capital investment ($15.40/kW) of all processes studied to date because of lower process equipment cost and higher waste bulk density; its annual revenue requirements (1.18 mills/kWh) were lower than all processes studied except untreated ponding. Capital investment costs are for mid-1979; annual revenue requirements are for mid-1980.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Waste Disposal	Pollution Control	13B	
Flue Gases	Sludge	Stationary Sources	21B	
Desulfurization	Fly Ash		07A,07D	
Economics	Gypsum		05C	
Scrubbers	Earth Fills		13I	13C
Calcium Oxides	Ponds		07B	08H
Limestone	Electrostatic Precipitators		08G	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Unlimited	Unclassified	209
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TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA-600/7-79-071	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Mobile Bed Flux Force/Condensation Scrubbers		5. REPORT DATE February 1979 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) S.C.Yung, R.Chmielewski, and S.Calvert		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Air Pollution Technology, Inc. 4901 Morena Boulevard, Suite 402 San Diego, California 92117		10. PROGRAM ELEMENT NO. EHE624A 11. CONTRACT/GRANT NO. 68-02-2124
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 11/75 - 12/78 14. SPONSORING AGENCY CODE EPA/600/13
15. SUPPLEMENTARY NOTES IERL-RTP project officer is Dale L. Harmon, MD-61, 919/541-2925.		

16. ABSTRACT The report gives results of an experimental determination of fine particle collection in mobile bed scrubbers. Particle collection efficiency increased greatly as the gas-phase pressure drop increased. With no water vapor condensation, the performance capability of a mobile bed scrubber is less than that of a gas-atomized spray scrubber with the same pressure drop. Compared to packed bed and sieve plate scrubbers, the mobile bed scrubber has better efficiency when the pressure drop is above 20 cm W.C. Limestone in the scrubber liquid has no effect on particle collection. When the mobile bed scrubber was used as a flux force/condensation (FF/C) scrubber, it had better performance characteristics than sieve plate and spray scrubbers with condensation. However, its capability is inferior to a FF/C system consisting of a condenser and venturi scrubber. Design equations reported in the literature are inadequate to predict the collection efficiency and pressure drop of the mobile bed scrubber. The study developed new correlations to predict particle collection and pressure drop.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Scrubbers Dust Aerosols Flux Density Condensing	Pollution Control Stationary Sources Mobile Bed Scrubbing Particulate Flux Force/Condensation	13B 07A,13I 11G 07D 14B
18. DISTRIBUTION STATEMENT Unlimited	19. SECURITY CLASS (This Report) Unclassified 20. SECURITY CLASS (This page) Unclassified	21. NO. OF PAGES 261 22. PRICE

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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-79-078		

4. TITLE AND SUBTITLE	5. REPORT DATE
Fugitive and Fine Particle Control Using Electrostatically Charged Fog	March 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Stuart A. Hoenig	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
University of Arizona Tucson, Arizona 85721	EHE624
	11. CONTRACT/GRANT NO.
	Grant R805228
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Final; 10/77 - 12/78
	14. SPONSORING AGENCY CODE
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15. SUPPLEMENTARY NOTES IERL-RTP project officer is Dennis C. Drehmel, MD-61, 919/541-2925.

16. ABSTRACT The report gives results of a study of fugitive and fine particle control using electrostatically charged fog. Most industrial pollutants acquire an electrostatic charge as they are dispersed into the air. Exposing this charged airborne material to an oppositely charged water fog enhances contact between the particles and the fog droplets. After contact, the wetted particles agglomerate rapidly and fall out of the atmosphere. This technique has been tested on a wide variety of industrial pollutants ranging from silica flour to SO2 and fly ash. In general, there has been significant suppression of pollution with a minimum of water fog. In addition, electrostatic hoods and screens can be used to push or direct pollutants to the proper area for collection. The system is therefore well suited to control of moving fugitive dust sources where the usual duct and baghouse systems are ineffective or too costly. The charged fog systems are now being tested in various industrial applications with generally good results. All work to date, including industrial applications that have been released by the companies involved, are discussed in the report. The report covers work on: developing new charged fog systems for controlling fugitive dust; demonstration testing of the systems in industrial locations; and designing and constructing a high-temperature stack simulator for fog gun testing.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Dust Aerosols Fog Electrostatics Processing Leakage Cyclone Separators	Pollution Control Stationary Sources Particulate Fugitive Emissions	13B 14B 11G 07A,13I 07D 04B 20C 13H

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-79-108		

4. TITLE AND SUBTITLE	5. REPORT DATE
Studies of Dust Cake Formation and Structure in Fabric Filtration: Second Year	April 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Bernard Miller, George Lamb, Peter Costanza, George Harriott, Janet Dunbar, and Michael Mokricki	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Textile Research Institute P.O. Box 625 Princeton, New Jersey 08540	10. PROGRAM ELEMENT NO. EHE624A 11. CONTRACT/GRANT NO. Grant R804926
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	13. TYPE OF REPORT AND PERIOD COVERED 12/77 - 12/78 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is James H. Turner, MD-61, 919/541-2925. Report EPA-600/7-78-095 covers the first year's work.

16. ABSTRACT The report describes experiments to improve fabric filter efficiency and pressure drop by use of electric fields near the filter surface. Modified fiber geometries and fabric construction are also investigated. Tests with patch filters showed pressure drops reduced to about 13 mm H2O from about 36 mm H2O upon the application of a 6 kV/cm electric field. Total fractional particle penetration was reduced to about 0.001 from 0.170 under the influence of the same field. The electric field was more effective when applied to filters having loose fibers at the surface. Deeply lobed fibers produced filters with higher efficiency, lower pressure drop, and better cleanability than filters made from round fibers. The effects were attributed to induced localized fields at the lobed surfaces. The fields were produced from collection of naturally charged particles. Fabric structure that promotes particle collection near the upstream surface of the filter gave the best performance.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Gas Filters Fabrics Dust Caking Electric Fields Fibers Shape	Pollution Control Stationary Sources Fabric Filters Particulate	13B 13K 12A 11E 11G 07A, 13H 20C

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1. REPORT NO. EPA-600/7-79-112	2.
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4. TITLE AND SUBTITLE Extended Tests of Saffil Alumina Filter Media	5. REPORT DATE May 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) M.A. Shackleton	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Acurex Corporation 485 Clyde Avenue Mountain View, California 94042	10. PROGRAM ELEMENT NO. EHE624A 11. CONTRACT/GRANT NO. 68-02-2611, Task 20
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	13. TYPE OF REPORT AND PERIOD COVERED Task Final; 2/78 - 2/79 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Dennis C. Drehmel, Mail Drop 61, 919/541-2925.

16. ABSTRACT The report gives results of research aimed at developing filter media performance data under simulated pressurized fluidized-bed combustion conditions for one ceramic filter media candidate. A low-solidity fiber bed, using Saffil alumina ceramic filters was selected. Dust feeding was tested at a nominal 800 C and 10 atm pressure, using reentrained fly ash which had been collected at the EPA/Exxon Miniplant. Tests were performed at three filter media face velocities: 2.5, 4.8, and 9.0 cm/sec. Each test was 200 hours long. Pressure drop and collection efficiency were determined as functions of time and filter face velocity. Off-line cleaning by reverse pulse was effective in maintaining low pressure drop (<1.25 kPa) after a cleaning cycle. Collection efficiency was high (>99.9 percent) and was maintained over the 200 hour test. Collection efficiency was also substantially independent of face velocity over the range tested. Outlet concentration was less than the most stringent requirements proposed for turbine applications (generally <1 mg/cu Nm). Outlet concentration showed a trend toward lower values at higher filtration velocity. Mechanical durability was indicated in that none of the test filters appeared to have been damaged by the 200-hour tests with cleaning at 10-minute intervals.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Filtration Combustion Fluidized Bed Processors Aluminum Oxide Ceramic Fibers Dust Fly Ash Gas Turbines	Pollution Control Stationary Sources Saffil Fibers Particulate	13B 11G 07D 21B 13G 07A 07B 11B, 11E

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EPA-600/7-79-113		

4. TITLE AND SUBTITLE	5. REPORT DATE
Comparison of the Availability and Reliability of Equipment in the Electric Utility Industry	May 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
J. C. Dickerman, R. T. Coleman, J. M. Burke, and C. C. Thomas	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Radian Corporation P.O. Box 9948 Austin, Texas 78766	EHE624
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EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	Task Final; 7/78 - 3/79
	14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is John E. Williams, Mail Drop 61, 919/541-2483.

16. ABSTRACT

The report gives results of a study to compare the reliability/availability of flue gas desulfurization (FGD) systems with equipment commonly used in the electric utility industry. Because many parameters used in reporting performance data for these systems have different definitions from one data reporting system to another, a direct comparison could not be made. However, a comparison model was developed--incorporating such factors as reliability, development status, and repair effort--to produce a single statistic that could be used to directly compare dissimilar pieces of equipment or systems. Study results indicate that a statistically meaningful comparison of the reliability/availability of utility FGD systems cannot now be made, primarily because of the small amount of FGD system performance data currently available. A meaningful comparison can be made only after more FGD systems are installed and more complete performance records become available.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution Flue Gases Desulfurization Electric Utilities Reliability Availability Mathematical Models	Pollution Control Stationary Sources	13B 21B 12A 07A, 07D 14D

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4. TITLE AND SUBTITLE	5. REPORT DATE
Controlling Particulate Emissions from Coal-fired Boilers	June 1979
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Jon Emerson	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Acurex Corporation 485 Clyde Avenue Mountain View, California 94042	EHE624A
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15. SUPPLEMENTARY NOTES IERL-RTP project officer is Dennis C. Drehmel, Mail Drop 61, 919/541-2925.

16. ABSTRACT The report gives a semi-technical overview of the contribution of particulate matter to the overall U.S. air pollution problem. It also discusses contributions of the Particulate Technology Branch of EPA's Industrial Environmental Research Laboratory at Research Triangle Park, N.C., aimed at solving the particulate pollutant control problem. Singling out fine particulates as a pollutant of major significance because of involved health hazards, the report discusses fundamental research in physical and chemical mechanisms particle formation and collection, as well as testing and demonstration projects that have been completed, are underway, or are planned. Among conventional control system components discussed are baghouses, wet scrubbers, and electrostatic precipitators.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution	Electrostatic Precipitators	Air Pollution Control	13B
Dust	Fabrics	Stationary Sources	11G
Research		Particulates	14B
Formations		Baghouses	
Collection			
Scrubbers			

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