REPORT ON

INDUSTRIAL HYGIENE SURVEY OF SELECTED PLANT OPERATIONS

Tyler Plant, Pittsburgh-Corning Corporation
Tyler, Texas

May 7, 1969

by

Morton Corn, Ph.D.

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I. INTRODUCTION

A survey to determine the adequacy of the existing ventilation system and associated dust collection equipment to control airborne dust was performed in the production area of the Pittsburgh-Corning Tyler, Texas plant on May 7, 1969 by Dr. Morton Corn. Dr. Corn was accompanied and assisted by Mr. John L. Hyde, of the Engineering Section, Pittsburgh-Corning Research Center, 800 Presque Isle Drive, Pittsburgh, Pennsylvania 15239. The survey was performed at the request of Mr. Byrl M. Stout, Vice President of Manufacturing, Pittsburgh-Corning Corporation. The request was made on April 28, 1969 at the Pittsburgh-Corning Research Center during a meeting called to discuss the enclosed citation of the Tyler plant by the Department of Labor (see Appendix A). The survey was concentrated exclusively on assessment of hygienic risk to airborne amosite asbestos dust and evaluation of plant facilities to reduce this risk.

During the period of the survey outdoor weather conditions were clear, sunny and warm, with temperatures in the 70-80°F range. Humidity was high. (Relative humidity in plant approximately 75%).*

The author is unaware of any special precautions taken to ensure that the ventilation system was operating in anything but the "normal" mode during this survey. Therefore, results of measurements made in this survey must be considered representative of conditions in the plant during summer months when doors and windows are open. In general, winter conditions impose more

*Measured at 11:45 AM in plant.

stringent requirements on plant dust control systems because windows and doors are closed to preserve heat. There is no benefit of "dilution ventilation" from outdoor air. With the same facilities for dust removal by a ventilation system, in-plant dust in air concentrations during winter months will usually exceed those present during summer months.

II. SUMMARY AND RECOMMENDATIONS

An industrial hygiene and ventilation survey of this plant performed on May 7, 1969 suggests that asbestos fiber concentrations are high in worker breathing zones (Builder and Feeder Operators) and at breathing level in certain other plant locations. There are no hygienic guidelines for concentration of Amosite fibers in air and the judgment of excessive dustiness in this plant is referred to guidelines for Chrysotile dust. Utilization of hygienic guidelines for Chrysotile asbestos concentration in air for Amosite asbestos fibers in air is an accepted procedure in the U. S. at this time. The finding of excessive dustiness at "spot" sampling locations in the plant is consistent with survey measurements which revealed inadequate quantities of air at local exhaust hoods. Insufficient air at local sites of dust emission was reflected in low air velocities at hood faces and low air conveying velocities in branch lines and ducts. The ventilation system was estimated for Builder and Feeder areas to move approximately one sixth of the air required to ventilate these processes.

In addition to the inadequacies of the ventilation system and the resultant excessive dustiness, it was found that general housekeeping is poor in the plant. Also, during the entire day of the survey not one employee in the production area was observed to wear a respirator.

In the opinion of the author, this short survey strongly suggests that employees at this plant are being exposed, on a daily basis, to excessive concentrations of Amosite asbestos dust. It is recommended that efforts be immediately focussed on design of a complete ventilation and dust collection system at this plant. The system is rudimentary in concept and is underdesigned. Efforts to "doctor up" this system would probably lead to a less than satisfactory system and would involve expenditures in time and equipment equivalent to those associated with design of a new system.

III. THRESHOLD LIMIT VALUE OF ASBESTOS DUST

"The threshold limit values refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. Because of wide variation in individual susceptibility exposures of an occasional individual at or even below the threshold limit may not prevent discomfort, aggravation of a pre-existing condition, or occupational illness.

"Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous conditions."*

The American Conference of Governmental Industrial Hygienists had, in 1967, a T.L.V. for asbestos of 5 million particles per cubic foot, as determined by impinger sampling and counting by light-field techniques. In a considered revision (1968), the Conference endorsed the retention of this T.L.V. for "most forms of asbestos". However, for crocidolite, because of the production of mesotheliomas, it was recommended that workers be equipped with air-supplied helmets because "no safe limit can be established for this form of asbestos at this time."

The British Occupational Hygiene society recently issued hygienic standards for chrysotile asbestos dust.** The standards are based on the objective that the risk of contracting asbestos

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*Extracted from the Preface, Threshold Limit Values for 1968. American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio 45202.

**Ann. Occup. Hyg. 11, 47-69 (1968).

be reduced to 1 per cent of those who have a lifetime's exposure to the dust. By "asbestosis" the committee meant the earliest demonstrable effects on the lung due to asbestos. These standards are cited here because they are more stringent than the U. S. guideline referred to above. The exposure guidelines are:

TABLE 1

BRITISH HYGIENIC GUIDELINES FOR ASBESTOS DUST

DUST CATEGORY	CONCENTRATION AVERAGED OVER 3 MONTHS Fibers/cm^3	MPPCF*
Negligible	0 - 0.4	0.011
Low	0.5 - 1.9	0.014 - 0.054
Medium	2.0 - 10	0.054 - 0.28
High	Over 10	Over 0.28

The concentrations refer to fibers greater than 5 microns in length as determined by the membrane filter method.

The problem faced today with respect to Amosite asbestos is that there simply is insufficient data for dosage-response prediction of exposed populations.** The guidelines for Chrysotile will undoubtedly continue to be the threshold limit value guideline for exposure to other forms of asbestos dust for years to come.

In a survey of dust concentrations in the Unibestos facility, Port Allegheny Plant of Pittsburgh-Corning, simultaneous impinger

*Million particles per cubic foot (as fibers).

**Stokinger, H. E."Development of TLV's for Fibrous Materials." Paper presented at Special Session on Fibers, Annual Meeting of American Industrial Hygiene Association, Denver, Colorado, May, 1969.

and membrane filter sampling was performed. The conversion of values obtained by one method to those of the other method was not possible. At each location, the numbers of the fibers and particles varied. The impinger method is based on particles while the membrane filter method assesses only fibers. For the purposes of this preliminary survey, either method would yield data suggesting that airborne dust concentrations were acceptable or unacceptable. Therefore, the membrane filter technique was used and the British guideline is applicable (Table I).

IV. DESCRIPTION OF SAMPLING AND ANALYTICAL METHODS

A. Assessment of Airborne Dust

Samples were obtained at either worker breathing zones as they performed their routine tasks, or at breathing level to represent "background air". Samples were obtained during a five or ten minute period at a flow rate of 21 lpm by utilizing a vacuum pump in conjunction with a filter holder and sample filter. The system was precalibrated in terms of pump inlet pressure and air flow with all sampling line components, including filter, in place.

A membrane filter (Type HA Millipore) was used to obtain samples for microscopic evaluation of fiber and dust particle concentrations. This paper is composed of pores 0.45 microns in size and has been shown to retain, with 100% efficiency, particles down to 0.05 micron diameter.[1]

The filter was first visually examined to detect any loose dust or uneven dust deposition. In the few cases where the filter deposit did not pass this examination, it was necessary to resuspend the collected dust in distilled water and refilter this suspension on VF grade Millipore filter to assure an even dust distribution over the entire filter area. A pie shaped segment of the filter was then placed on a microscope slide and rendered completely transparent with Cargille certified index of refraction liquids. Cargille liquid of index of refraction 1.500 was usually most suitable. The counting of the dust particles and the counting and sizing of asbestos fibers was performed with the aid of a

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[1]Megaw, W. J. and Wiffen, R. D.: Int. J. Air Water Poll. 1, 501 (1963).

Zeiss Photomicroscope using Phase Contrast Illumination. The objective lens was a Zeiss Neofluor Ph 63x with a numerical aperture of 0.90. The eyepiece had a magnification of 20x and contained a calibrated Porton graticule. The optovar feature of the Zeiss scope contributed to the total magnification of 2016x. Resolution was approximately 0.35 microns. Particles and fibers of size 0.30 microns could be detected.

In the evaluation procedure, all particles and fibers in the Porton field of view were counted and the fibers were grouped by fiber length into three categories (less than five microns, five to ten microns, and larger than ten microns). This procedure was repeated for a number of randomly selected fields on the face of the filter. Because only a portion of the total filter area was evaluated by this method, it was necessary to correct the count by the ratio of the total filter area to the evaluated area. The resultant particle or fiber number was divided by the volume of the air sample to obtain dust or fiber concentration expressed as millions of particles per cubic foot (MPPCF).

The statistical reliability of the evaluation was expressed as the standard deviation, calculated as $N^{1/2}$, where N is the particle or fiber count.

The procedure outlined follows, in its essential points, that recommended by J. R. Lynch and H. E. Ayer in their article "Measurement of Asbestos Exposure" which appeared in the Journal of Occupational Medicine, Volume 10, January, 1968.

B. Measurement of Air Velocities at Hoods

A calibrated velometer was used to measure face velocities of hoods and room air velocities.*

C. Air Velocities in Ventilation Ducts

A standard 1/4" diameter pitot tube was used in conjunction with a Dwyer 1:10 inclined manometer to determine velocity pressures in ducts. Ten point traverses were taken in larger ducts (>6" diameter); centerline readings only were obtained in smaller ducts. All measurements are considered to be approximate (estimated reliability ± 10%) because of the conditions imposed by the system. For example, there were few locations where measurements could be made 10 diameters from entries or elbows. Also, the standard pitot tube should not be used in lines smaller than 8" diameter. However, the reliability of measurements achieved is perfectly adequate for a preliminary survey of the type undertaken here.

*Alnor Velometer, Illinois Testing Laboratory, Chicago, Illinois.

V. RESULTS AND DISCUSSION

A. Airborne Dust Concentrations

Measured concentrations of dust particles and asbestos fibers are summarized in Table 2. In order to facilitate comparison with the guidelines from Table 1, the last two columns (5 and 6) of Table 2 for fiber concentrations have been added to yield Column 7, which should be compared with Column 3 of Table 1. On this basis, operators at the feeders are receiving High exposures. Builder operators are also receiving High exposures. Although much dust is present at the cutting operation the single sample obtained suggests that particles and not fibers are the major contributors to the dispersion. Table 2 suggests that outdoor air is Negligible in terms of fiber content, as is the dust collector effluent. However, the aisle of the warehouse opposite the Feeders is High, suggesting the large zone of influence of the dust sources in the Feeder areas. It cannot be too strongly stressed that these are "spot" samples and must be viewed as suggestive results only. However, they do convey a picture of high dust exposures in Feeder and Builder areas, as well as in adjacent zones. The author must state, based on previous experience, that dust concentrations in plant air would almost certainly increase during winter months.

B. Local Exhaust Hood Face Velocities

There are design guidelines for face velocities of air at local exhaust hoods.* In general, a face velocity of 100 fpm is

*See Chapter 5, Industrial Ventilation, 10th Ed. American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio.

TABLE 2

ASBESTOS FIBER CONCENTRATIONS AT SELECTED PLANT LOCATIONS

Date and Time of Sample	Description of Sampling Site	Dust Particle or Fiber Counts, Expressed as Millions of Particles Per Cubic Foot + Standard Deviation				
		Particles	Fibers			Total (Cols. 5 + 6)
			<5 μ	5-10 μ	>10 μ	
5/7 2:30 PM-2:35 PM	Breathing zone of Feeder Operator, Lines 1 and 2 during sweeping, feeding. (Note: cooling fan at dust collector on.)	12.3±0.6	3.60±0.28	0.64±0.12	0.14±0.04	~~0.92~~ .78
5/7 2:36 PM-2:46 PM	Breathing level in Walkway adjacent to Feeder No. 3.	10.5±0.5	3.40±0.19	0.34±0.06	0.14±0.04	0.48
5/7 2:50 PM-	Effluent from Dust Collector Bags approx. 1" from Bag. Dust collector for Lines 1 and 2.	2.9±0.2	0.71±0.09	0.06±0.03	0.02±0.02	0.08
5/7 3:05 PM-3:15 PM	Outdoor air sample at breathing level on loading dock near Oil House.	1.5±0.2	0.16±0.04	0.03±0.02	0.05±0.02	0.08
5/7 3:15 PM-3:25 PM	Breathing level in aisle, Unibestos Warehouse opposite Feeder Lines 1 and 2.	35.0±1.7	1.26±0.12	0.18±0.03	0.10±0.02	0.28
5/7 3:30 PM-3:40 PM	Breathing zone of Builder Operator, Line No. 3 (3/4 x 1 Unibestos). Cycle of loading, building, spraying, etc. Note: Fans on over Lines 2 and 3.	3.2±0.2	1.48±0.09	0.18±0.03	0.10±0.02	0.28
5/7 3:45 PM-3:56 PM	Breathing zone of Builder Operator, Line No. 3. Cycle of loading, building, spraying, etc.	12.5±0.6	4.02±0.20	0.20±0.04	0.21±0.05	0.41 14.5 fibers/cc
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Circled samples ... fibers/cc which exceeds ... std.

TABLE 2 (continued)

5/7 4:05 pm- 4:15 pm	Breathing zone of Operator, Large Cutting Saw. Note: Door adjacent to cutting operation open to outdoor air.	37.4±1.8	1.11±0.11	0.07±0.03	0.05±0.024	0.12 [illegible]
(1)	(2)	(3)	(4)	(5)	(6)	(7)

[illegible] exposure values as set by the [illegible] Department of Labor Safety & Health Standards.

Table II states: asbestos 12 fibers/ml greater than 5µ in length* or a TLV = 2 MPPCF

* → As determined by the membrane filter method at 430 X phase contrast magnification

recommended for control of fume and vapors, while higher velocities are not uncommon for control of materials emitted with great force. At the Port Allegheny Plant, Mr. John Hyde, of Pittsburgh-Corning, and the author are designing for 200 fpm face velocity at hoods which interface with plant air: internal process hoods are designed for 100 fpm.

Table 3 is a summary of measured air velocities at selected hoods in the Tyler Plant. With the exceptions of the Builder hoods and the Scrap Grinder hood, face velocities at hoods are inadequate. Smoke tube tests performed at each hood offered visual confirmation of this conclusion based on velocity measurements. Although the hood on the Intermediate Saw was satisfactory, it would not be so if two or more saws were used simultaneously.

C. Air Flow Associated with Local Exhaust Hoods and Dust Collectors

Figure 1 is a line diagram of the ventilation ducts in the Feeder and Builder Areas. The duct locations for Pitot tube traverses are denoted by numbers. Table 4 is a summary of volume of air flowing at these points as determined on the day of this survey. The values listed in Table 4 are probably overestimates because certain of the ducts were partially clogged with settled fibers. All data and calculations for the Table 4 summary are included in Appendix B.

Table 4 and data in Appendix B indicate the following:

1. Air is very poorly distributed in the ventilation system. As an example, hoods 2, 3 and 4 for similar operations were allocated 63, 391 and 202 cfm respectively.

TABLE 3

UNIBESTOS LINES: SUMMARY OF HOOD AIR VELOCITIES

Location		Site of Measurement* and Average Air Velocity, fpm**		
Line No. 1	40" Fiber Feeder+	Left Side	Top	0
			Middle	0
			Bottom	0
		Center	Top	50
			Bottom	50
		Right Side	Top	0
			Bottom	0
		Note: Smoke tube test revealed poor control.		
Line No. 1	30" Fiber Feeder+	Left Side	Top	20
			Bottom	20-30
		Center	Top	60
			Bottom	60
		Right Side	Top	60
			Bottom	50
Line No. 1	30" Fiber Feeder+	Left Side	Top	20
			Middle	0
			Bottom	0
		Center	Top	20
			Middle	0-10
			Bottom	0-10
		Right Side	Top	20-30
			Middle	30
Line No. 1	40" Fiber Feeder	Left Side	Top	0
			Middle	0
			Bottom	0
		Center	Top	10
			Middle	10-30
			Bottom	10-30
		Right Side	Top	0
			Middle	20
			Bottom	20
Line No. 2	40" Fiber Feeder (Note: Approx. 75% of hood face blocked by fiber)	Left Side	Top	50-100
			Middle	75-100
			Bottom	75-100
		Center	Top	30-40
		Right Side	Top	30
			Bottom	50

+Room air in vicinity of feeders measured to be 30-40 fpm, South to North (fans off). Room air in vicinity of feeders measured to be 300 fpm, South to North (fans on).

TABLE 3 (continued)

Line No. 2	30" Fiber Feeder	Stand by (not in use)		
Line No. 2	30" Scrap Feeder	Left Side	Top	10-50
			Middle	30
			Bottom	20
		Center	Top	20
			Middle	40
			Bottom	30
		Right Side	Top	0
			Middle	40
			Bottom	20
		Left Side	Top	75-100
			Bottom	100
		Center	Top	100
			Middle	100
			Bottom	75-100
		Right Side	Top	125
			Bottom	75-100
Line No. 3	20" Scrap Feeder	Left Side	Top	0
			Bottom	20-30
		Right Side	Top	0
			Bottom	30-40
Builder Hoods		Line No. 2		125-150
		Line No. 3		150
		Line No. 1	Invalid measurements because instrument could not be properly placed. Smoke tube revealed good control.	
Scrap Grinder Hood		Left Side	Top	75-100
			Middle	100-150
			Bottom	150
		Center	Top	75
			Middle	75-100
			Bottom	100
		Right Side	Top	50-75
			Middle	50-75
			Bottom	50-75
Saw Area:	Intermediate Saw+			200-300

+Large Rip Saw Off.

*All measurements in vertical plane at hood face, unless otherwise specified.

**Feet per minute.

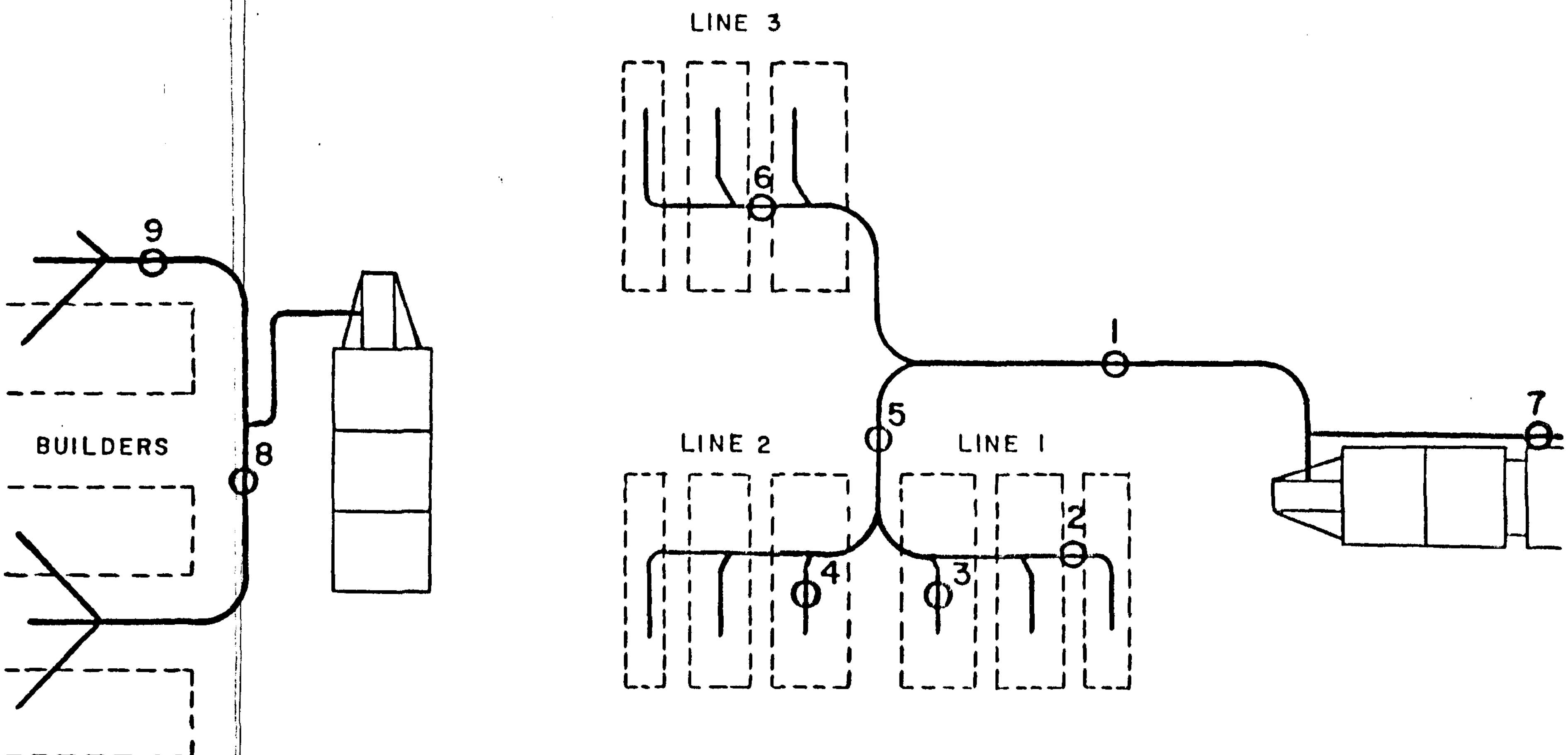


Figure 1. Schematic of Unibestos Lines Showing Ventilation System and Pitot Traverse Points. Tyler Plant, Pittsburgh-Corning Corporation

Scale: 1" = 8'-0"

Source: Dwg. No. 56-2002-0 (6-12-56).

TABLE 4

SUMMARY OF VOLUMETRIC AIR FLOWRATES IN DUCTS
IN FEEDER AND BUILDER AREAS

Duct Number (Figure 4)	Air Flow, Cubic Feet Per Minute
Feeder Area:	
1	2,769
2	63
3	391
4	202
5	1,940
6	183
7	877
Builder Area:	
8	1,724
9	810

2. Conveying velocities within ducts are generally very low for handling asbestos dust. A minimum design velocity of 4000 fpm is being used for the new ventilation system.* Duct 7 (Scrap Grinder Hood) and the 10" diameter duct into the Block Dust Collector were the only ducts with adequate air velocities for conveying asbestos dust.

3. Total air volume for the Builder and Feeder areas is very low (2769 + 1724 + 877 cfm). Estimates for Port Allegheny place the air requirements for adequate control for three lines at approximately 6.5x times this amount of air.

In summary, as judged by three different parameters, i.e. dust concentrations, face velocities at hoods, and duct air volumes, the ventilation system, and hence dust control at this plant, are unsatisfactory.

D. General Housekeeping

In general, housekeeping is judged to be poor at this plant. Appendix C is a selection of photographs taken during this survey. Asbestos dust is on all surfaces as well as in the air. It was noted that with the exception of Mr. Hyde and the author not a single person in the plant wore a respirator. It can only be concluded that Amosite fiber at this plant is not being handled with the care and respect that any substance with this toxic potential deserves.

The practice of exhausting bag dust collectors to plant air would not be permitted in the states of Pennsylvania and New York. Air cannot be recirculated when toxic substances are

*Port Allegheny Plant.

involved. In the case of nuisance substances, recirculation is permitted if the recirculated air contains the toxic agent in concentrations less than 20% of the Threshold Limit Value.

VI. ACKNOWLEDGEMENT

The author wishes to express his appreciation to Mr. John L. Hyde, of Pittsburgh Corning Corporation. Mr. Hyde provided invaluable assistance with survey measurements.

APPENDIX A

1. Letter from W.R. Blair, Regional Director, U. S. Department of Labor, Dallas, Texas, to J. H. Bierer, President, Pittsburgh-Corning.
2. Letter from B. M. Stout, Vice-President, Pi-tsburgh-Corning to W. R. Blair.
3. Letters from M. Corn to W. R. Blair.

U.S. DEPARTMENT OF LABOR
BUREAU OF LABOR STANDARDS
Office of Occupational Safety
Room 601, 411 N. Akard Street
Dallas, Texas 75201

April 8, 1969

Mr. James H. Bierer, President
Pittsburgh Corning Corporation
1 Gateway
Pittsburgh, Pennsylvania

Dear Mr. Bierer:

A recent survey of your establishment revealed that certain conditions did not meet the Safety and Health Requirements of the Walsh-Healey Public Contracts Act.

The Act stipulates that "No part of such contract will be performed nor will any of the materials, supplies, articles or equipment to be manufactured or furnished under said contract, be manufactured or fabricated in any plants, buildings or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of the employees engaged in the performance of the contract."

Enclosed is a notice listing those unsatisfactory conditions found, and you should take corrective action immediately.

You are requested to notify me on or before the compliance date on the notice concerning action taken to correct the unsatisfactory conditions.

Sincerely yours,

Wendell R. Blair
Regional Director

Enclosure
cc: Mr. Charles Van Horne, Wks. Manager, Owentown, Texas

U.S. DEPARTMENT OF LABOR
BUREAU OF LABOR STANDARDS

NOTICE OF

SAFETY AND HEALTH VIOLATIONS

NAME OF FIRM				CONTRACTOR NUMBER
Pittsburg Corning Corporation				
STREET ADDRESS	CITY	COUNTY	STATE	ZIP
Box 3057 - Tyler, Texas	Owentown	Smith	Texas	75701

OFFICIALS CONTACTED - NAME AND TITLE	PLANT SURVEY MADE WITH	COMPLIANCE DATE
Charles E. Van Horne, Wks. Manager	Mr. Van Horne	
	REPORT FURNISHED TO James H. Bierer, President	May 8,1969
	USDL SAFETY ENGINEER M. Padilla, Industrial Hygienist	DATE OF SURVEY 2/13/69

A SURVEY OF YOUR FACILITIES HAS REVEALED CONDITIONS WHICH DO NOT COMPLY WITH USDL SAFETY AND HEALTH REQUIREMENTS UNDER THE PUBLIC LAW CHECKED.

THE CONDITIONS ARE LISTED BELOW WITH REFERENCE TO CODES AND STANDARDS WHICH HAVE BEEN ADOPTED AS THE DEPARTMENT'S SAFETY AND HEALTH REQUIREMENTS.

THESE UNSATISFACTORY CONDITIONS MUST BE CORRECTED. PLEASE ADVISE REGIONAL DIRECTOR Wendell R. Blair ON OR BEFORE May 8, 1969 AS TO THE CORRECTIVE ACTION TAKEN.

PUBLIC LAW - 74-846 WALSH-HEALEY PUBLIC CONTRACTS ACT	X
PUBLIC LAW 89-286 MCNAMARA-O'HARA SERVICE CONTRACTS ACT	
PUBLIC LAW 89-209 ARTS AND HUMANITIES ACT	
PUBLIC LAW 89-333 VOCATIONAL REHABILITATION ACT	

NO.	CODE-STANDARD REFERENCE	CORRECTIONS REQUIRED
		UNSATISFACTORY CONDITIONS NOTED ON INDUSTRIAL HYGIENE SURVEY OF 2/13/69
		Process Area
1.	50-204.264	No certified first aiders. Ex: Recommend that several employees be trained so that each shift will have qualified personnel to take care of emergencies.
2.	50-204.275, Ind. Vent. ACGIH 5-98	Local exhaust ventilation not according to standards. — WHAT ARE THE STANDARDS? Ex: Local exhaust ventilation system was tested with the following findings: a. Grinder hood, 25-50 fpm at face. b. Feeder at material point of entry, 50 fpm. c. Scrap feeder at material point of entry, 50 fpm. d. Sawing ducts 500 fpm at face. Recommend that employer make a study of present local exhaust ventilation with professional advice, to come up to standard. It is believed that present system is below the required capacity. (2) ACCORDING TO PAR. 50-204.275, IF AN EMPLOYEE IS WEARING AN APPROVED RESPIRATOR IN AN [illegible] AREA, THE CO. IS NOT IN VIOLATION. OUR EMPLOYEES USE RESPIRATORS IN ALL DUST AREAS (2) I HAVE NO REFERENCE IN MY COPY OF THE WALSH-HEALEY PUBLIC CONTRACTS ACT (SECTION 1) OF SUGGESTED SUCTION VELOCITIES OR RATES. (1) ARRANGEMENTS WERE MADE OVER 3 WEEKS AGO WITH [illegible]

PITTSBURGH CORNING CORPORATION

April 11, 1969

[illegible], Regional Director
[illegible] of Labor
[illegible] Standards
[illegible] Occupational Safety

[illegible] Street
[illegible] 75201

Subject: Letter of 4/3/69 to Mr. [illegible], President,
Pittsburgh Corning Corporation.
Re: [illegible] Plant - Tyler, Texas - 2/13/69

Dear Mr. [illegible]:

The following action is being taken to correct the unsatisfactory conditions noted in the report dated February 13, 1969.

1. [illegible] - Ref. [illegible].

All supervisory employees were enrolled in a first aid course given by the American Red Cross with the first session given 4-10-69. The course is to consist of three sessions and by 5-10-69 there will be fully qualified personnel on all shifts.

2. [illegible] Standard - Ref. [illegible].

Pittsburgh Corning Corporation uses the services of Lee B. [illegible], M.D., Medical Director, PPG Industries, and his staff, to monitor its production facilities for compliance with A.C.G.I.H. threshold limits for dust concentrations. (See attachments II and III). In addition, the Industrial Hygiene Foundation conducts periodic dust measurements to ascertain the dust concentrations present. (See attachment I).

For those areas in which dust concentrations exceed the threshold limits, it is required, as a condition of employment, that each employee wear a Dust Foe 66S Respirator [illegible]-73020 approved by the U. S. Bureau of Mines.

2. [illegible] (continued).

In reference to the sentence of your report where you state, "It is believed that the present system is below the required efficiency", the dust measurements do not support this belief. Pittsburgh Corning Corporation retains the services of Dr. [illegible] Corn, a consulting engineer and authority in the field of industrial hygiene and air pollution. Dr. Corn approves all [illegible] as well as any modifications of our dust collecting systems.

If you should need any additional information or there is need for [illegible], please advise.

Yours very truly,

PITTSBURGH CORNING CORPORATION

Cyril Stout

Cyril M. Stout
Vice President of Manufacturing

[illegible]
[illegible]

cc: [illegible] H. [illegible]
[illegible]
[illegible] Underwood
[illegible] C. [illegible] von Horne

MORTON CORN, PH. D., B. CH. E.
CONSULTING ENGINEER
310 BOWER HILL ROAD
PITTSBURGH, PENNSYLVANIA 15228

INDUSTRIAL HYGIENE
AIR POLLUTION

TELEPHONE
412 - 561-6237

May 1, 1969

Mr. Wendell K. Blair, Regional Director
U. S. Department of Labor
Bureau of Labor Standards
Office of Occupational Safety
Room 601
411 North Akard Street
Dallas, Texas 75201

Subject: Letter of 4/8/69 to Mr. J. H. Bierer, President, Pittsburgh Corning Corporation.
Re: Survey Plant - Tyler, Texas - 2/13/69

Dear Mr. Blair:

I am writing to clarify the letter from Byrl M. Stout, Vice President of Manufacturing, Pittsburgh Corning Corporation to you dated April 11, 1969.

I have been working with Pittsburgh Corning Central Engineering engineers on dust control in their Port Allegheny, Pennsylvania Works. The manufacturing operation in this plant is similar to that in the Tyler, Texas Plant. We are installing an entire ventilation system and dust collectors at Port Allegheny.

However, it should be noted that I have never visited or surveyed the Tyler, Texas Plant of this Corporation. I first saw the letter from Mr. Stout to you on April 28, 1969. At that time, Mr. Stout suggested that I visit the Tyler Plant and I have scheduled to do so on May 7, 1969. You may rest assured that all the engineering skills which have been brought to bear on the Port Allegheny Plant dust control system will be focused on the Tyler Plant.

Sincerely yours,

Morton Corn, Ph.D.

cc: Lee B. Grant, M.D.
Byrl Stout

APPENDIX B

DUCT VELOCITY DETERMINATIONS
(Primary Data and Calculations)

PITOT TUBE TRAVERSE
Duct 1 (17" Line)

In front of 40" feeder, Line #1, feeds from Lines 1, 2, 3 before blower.

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/2	0.00	0.000	0
2	1 3/8	-0.04	-0.200	-801
3	2 1/2	0.16	0.400	1602
4	3 7/8	0.32	0.566	2267
5	5 3/4	0.44	0.663	2655
6	11 1/4	0.60	0.774	3100
7	13 1/8	0.58	0.762	3052
8	14 1/2	0.48	0.693	2775
9	15 3/8	0.20	0.447	1790
10	16 1/2	0.08	0.283	1133
		Totals	4.388	17573
		Averages	0.439	1757

Q = 2769 cfm

PITOT TUBE TRAVERSE
Duct 2 (5" Line)

VP Centerline = 0.02 "H_2O; V = 566 fpm

Q = 63 cfm

PITOT TUBE TRAVERSE
Duct 3 (6" Line)

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/8	1.20	1.095	4385
2	1/2	1.15	1.072	4293
3	7/8	1.10	1.049	4201
4	1 3/8	0.80	0.894	3580
5	2	0.52	0.721	2888
6	4	0.00	0.000	0000
7	4 5/8	0.02	0.141	565
8	5 1/8	0.00	0.000	0000
9	5 1/2	0.00	0.000	0000
10	5 7/8	0.00	0.000	0000
		Totals	4.974	19913
		Averages	0.497	1991

Q = 391 cfm

PITOT TUBE TRAVERSE
Duct 4 (4" Diam)

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/8	0.2	0.447	1790
2	1/2	0.2	0.447	1790
3	2	0.7	0.837	3352
		Totals	1.731	6932
		Averages	0.577	2311

Q = 202 cfm

PITOT TUBE TRAVERSE
Duct 5 (12" Diam)

12" Duct, Line 1 + 2 main leading to 17" main

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	3/8	0.28	0.529	2119
2	1	0.34	0.583	2335
3	1 3/4	0.36	0.600	2403
4	2 3/4	0.36	0.600	2403
5	4 1/8	0.38	0.616	2467
6	7 7/8	0.40	0.632	2531
7	9 1/4	0.42	0.648	2595
8	10 1/4	0.44	0.663	2655
9	11	0.44	0.663	2655
10	11 5/8	0.40	0.632	2531
		Totals	6.168	24695
		Averages	0.617	2470

Q = 1940 cfm

PITOT TUBE TRAVERSE
Duct 6 (6" Diam)

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/8	0.04	0.200	801
2	1/2	0.06	0.245	981
3	7/8	0.08	0.283	1133
4	1 3/8	0.10	0.316	1266
5	2	0.10	0.316	1266
6	4	0.06	0.245	981
7	4 5/8	0.06	0.245	981
8	5 1/8	0.04	0.200	801
9	5 1/2	0.02	0.141	565
10	5 7/8	0.02	0.141	565
		Totals	2.333	9339
		Averages	0.233	934

Q = 183 cfm

PITOT TUBE TRAVERSE
Duct 7 (6" Diam)

Point	Position (inches from wall)	Velocity Pressure (VP) ("H2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/8	1.12	1.058	4237
2	1/2	1.26	1.122	4494
3	7/8	1.26	1.122	4494
4	1 3/8	1.28	1.131	4530
5	2	1.26	1.122	4494
6	4	1.32	1.149	4602
7	4 5/8	1.34	1.158	4638
8	5 1/8	1.30	1.140	4566
9	5 1/2	1.22	1.105	4426
10	5 7/8	1.08	1.039	4161
		Totals	11.148	44640
		Averages	1.115	4464

Q = 877 cfm

PITOT TUBE TRAVERSE
Duct 8 (11" Diam)

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/4	0.24	0.490	1962
2	7/8	0.28	0.529	2119
3	1 5/8	0.32	0.566	2267
4	2 1/2	0.34	0.583	2335
5	3 3/4	0.38	0.616	2467
6	7 1/4	0.42	0.648	2595
7	8 1/2	0.42	0.648	2595
8	9 3/8	0.40	0.632	2531
9	10 1/8	0.86	0.927	3713
10	10 3/4	0.78	0.883	3536
		Totals	6.523	26121
		Averages	0.652	2612

Q = 1724 cfm

PITOT TUBE TRAVERSE
Duct 9 (11" Diam)

Point	Position (inches from wall)	Velocity Pressure (VP) ("H2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/4	0.36	0.600	2403
2	7/8	0.38	0.616	2467
3	1 5/8	0.38	0.616	2467
4	2 1/2	0.38	0.616	2467
5	3 3/4	0.38	0.616	2467
		Totals	3.066	12271
		Averages	0.613	2454

Assumption: 1/2 duct area is blocked by fiber

$\therefore$ Q = 810 cfm

PITOT TUBE TRAVERSE

17" Duct in Saw Area: Main Duct into Dust Collector

Point	Position (inches from wall)	Velocity Pressure (VP) ("H_2O)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/2	0.44	0.663	2655
2	1 3/8	0.46	0.678	2715
3	2 1/2	0.68	0.825	3304
4	3 7/8	0.74	0.860	3444
5	5 3/4	0.80	0.894	3580
6	11 1/4	0.82	0.906	3629
7	13 1/8	0.70	0.837	3352
8	14 1/2	0.66	0.812	3252
9	15 5/8	0.72	0.849	3400
10	16 1/2	0.48	0.693	2775
		Totals	8.017	32108
		Averages	0.802	3211

Q = 5061 cfm

PITOT TUBE TRAVERSE

10" Duct into Block Dust Collector

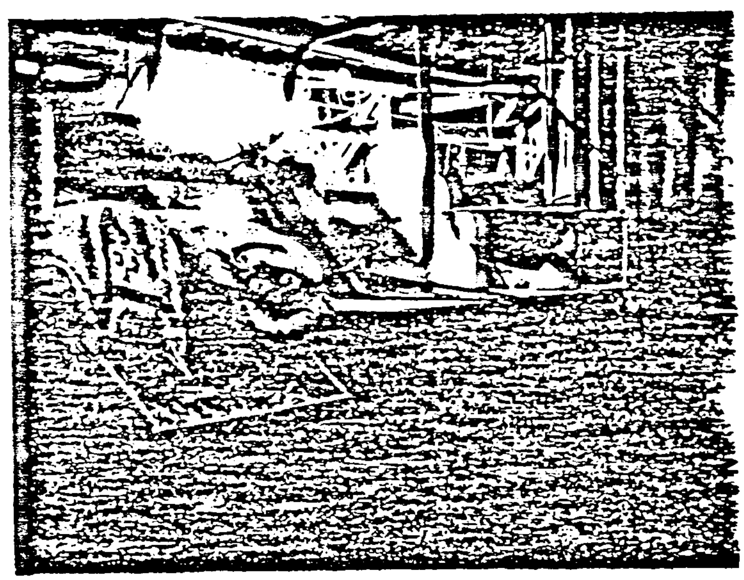
Point	Position (inches from wall)	Velocity Pressure (VP) ("H20)	$\sqrt{VP}$	Air Velocity (fpm)
1	1/4	1.66	1.288	5158
2	7/8	1.66	1.288	5158
3	1 1/2	1.50	1.225	4906
4	2 1/4	1.40	1.183	4738
5	3 3/8	1.26	1.122	4494
6	6 5/8	0.74	0.860	3444
7	7 3/4	0.70	0.837	3352
8	8 1/2	0.70	0.837	3352
9	9 1/8	0.82	0.906	3629
10	9 3/4	0.84	0.917	3673
		Totals	10.463	41904
		Averages	1.046	4190

Q = 2285 cfm

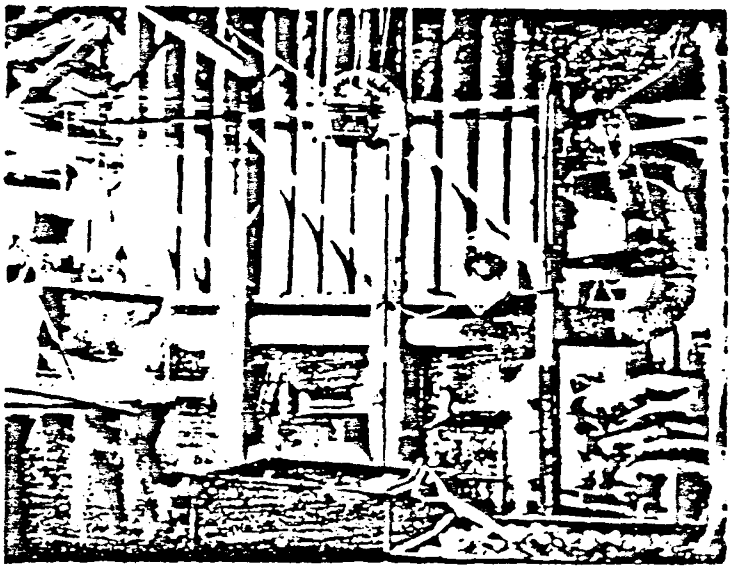
APPENDIX C

PHOTOGRAPHS OF SELECTED PLANT OPERATIONS.

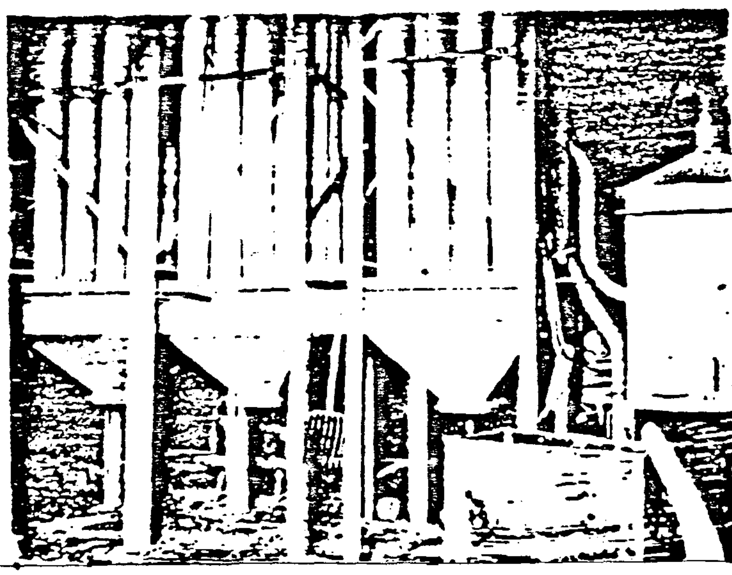
Lines 1 and 2 Feeders Showing Method of Emptying Bag



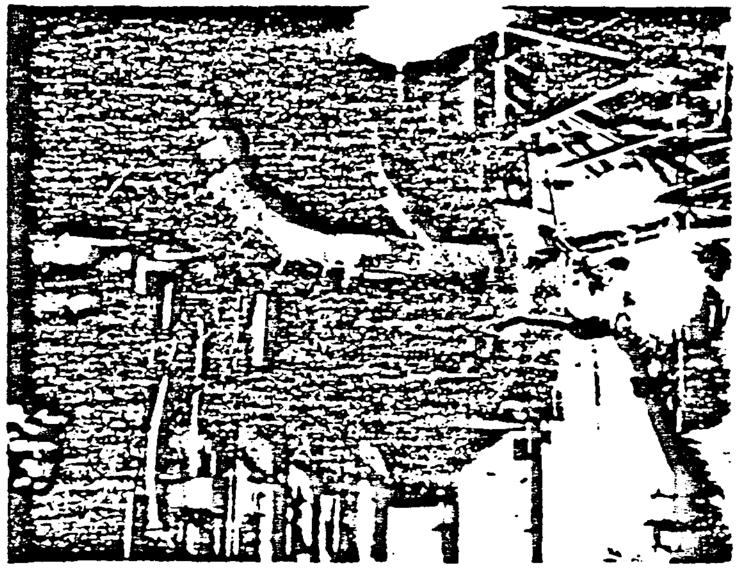
Line 2 Feeders and Bag Collector (Note Cart for Scrap Feed)



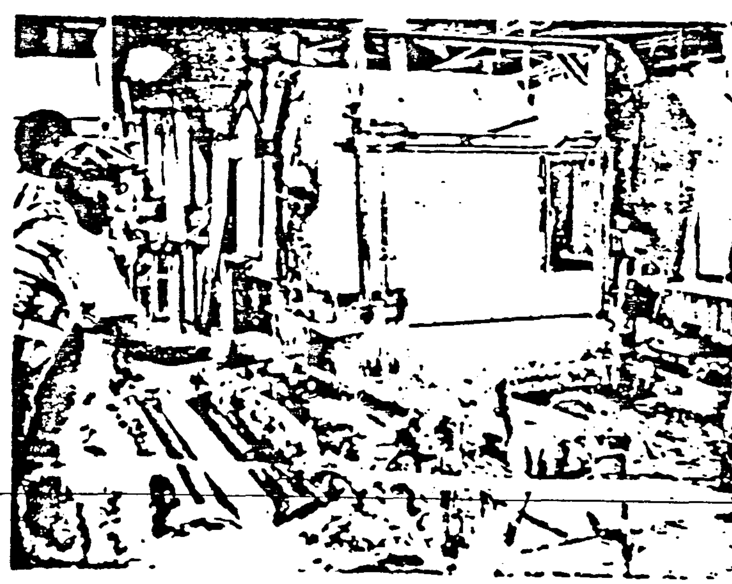
Close up of scrap feed and bag collector (Line 2) note axial fans directed at carts and feeder hoods.



Scrap cutter hood and dust collector

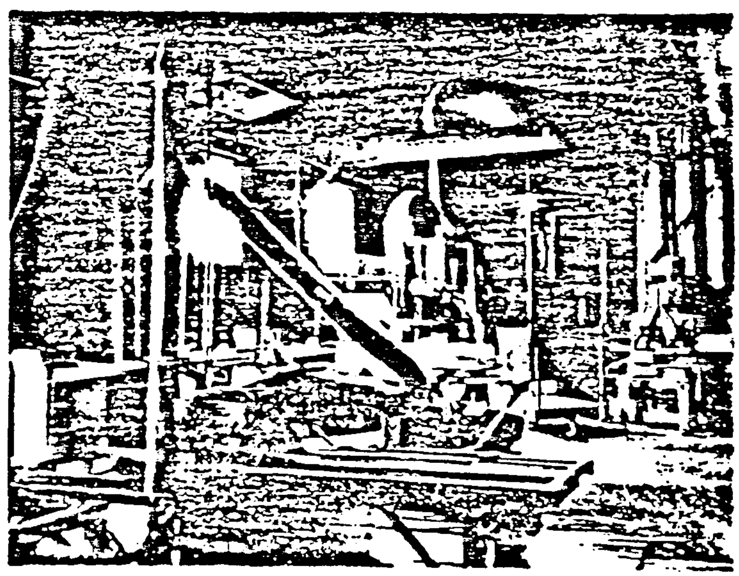


Dust collector for scrap hood and feeders (Line 1-3), showing scrap hood entry closest to blower intake.

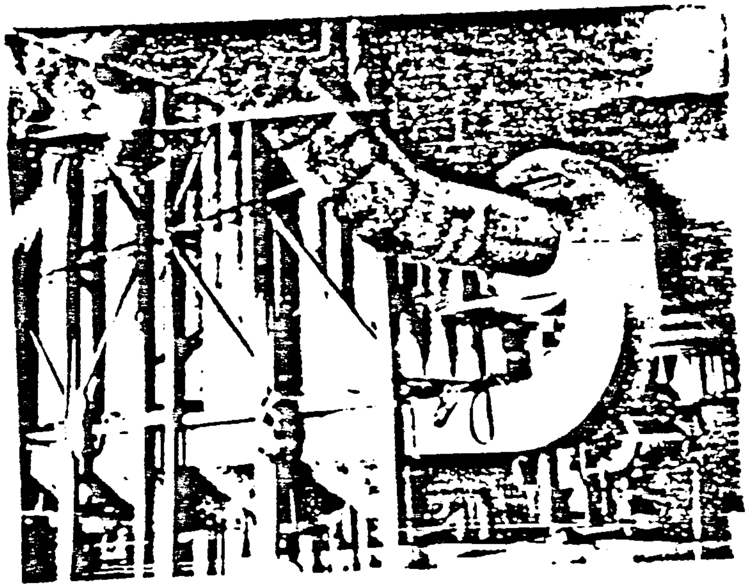


Builder on Line No. 2

Large cutting saw showing hoods



Cutting area dust collector and
two saws with attached hoods



Cutting saw, dust collector
and blower (close up)