WALK-THROUGH SURVEY REPORT
Contract #210-77-0096
Westinghouse Air Brake Company
Wilmerding, Pennsylvania 15148

DATE OF SURVEY
January 25, 1979

DATE OF REPORT
August 31, 1979

The Johns Hopkins University
Baltimore, Maryland

and

The National Institute for Occupational Safety and Health
Cincinnati, Ohio

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G. Matanoski and D. Schott

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16. Abstract (Limit: 200 words)

A walk-through survey was conducted on January 25, 1979, to determine whether the Westinghouse Air Brake Company (SIC-5198) of Wilmerding, Pennsylvania, would be suitable for inclusion in an in-depth epidemiological, industrial hygiene, and medical study of health hazards in the painting trades. Methods of paint application and types of paint used were evaluated, along with the areas in which painting operations were conducted. The workforce and personnel records system, medical and industrial hygiene programs, and engineering controls were described. The authors conclude that even though painters had excellent controls for removal of paint and paint vapors, potential exposure of up to 18 employees was observed. The company had an excellent record system which allowed identification of employees over several years. NIOSH recommend that this site be considered for an in-depth study of potential hazards of the painting industry.

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WALK-THROUGH SURVEY REPORT
Contract #210-77-0096
Westinghouse Air Brake Company
Wilmerding, Pennsylvania 15148

PURPOSE

To determine whether this site would be suitable for inclusion in an in-depth epidemiological, industrial hygiene, and medical study of health hazards in the painting trades.

PERSONS CONDUCTING SURVEY

Genevieve M. Matanoski, M.D., Epidemiologist, The Johns Hopkins University
Don Schott, M.S., Industrial Hygienist, The Johns Hopkins University
Dennis Zaebst, M.S., Industrial Hygienist, The National Institute for Occupational Safety and Health

PERSONS PREPARING REPORT

Dr. Genevieve M. Matanoski, The Johns Hopkins University
Mr. Don Schott, The Johns Hopkins University

PLANT CONTACTS

Mr. Harold Baughman, Personnel-Safety Administrator
Mr. George Janiszewski, Manager, Property Conservation
Mr. Mark Jackson, Industrial Hygienist

UNION

United Electrical, Radio and Machine Workers of America, Local 610 (represents painters)
Westinghouse Air Brake Office and Technical Workers

Union Officials

Mr. Norman Hurst, President
United Electrical, Radio & Machine Workers of America, Local 610
522 Station Street
Wilmerding, Pennsylvania 15148

Mr. Joseph Prementine, President
Westinghouse Air Brake Office & Technical Union
407 Commerce Ave.
Wilmerding, Pennsylvania 15148

DESCRIPTION OF PLANT

This company is located 14 miles east of Pittsburgh's golden triangle (the confluence of the Monongahela and Allegheny Rivers to form the Ohio River) in Wilmerding. The plant is situated on 33 acres between Turtle Creek and the Penn-Central Railroad which accounts for its spread out appearance. See Appendix 1. The facility has thrived since its inception in 1869 under the leadership of George Westinghouse after the advent of the air brake. Since the plant is so close to water, several floods have occurred in its 110 year history.

Manufacturing takes place in about 15 buildings which include a foundry (building 1 complex), vast machine shops (building 25 complex), and finish product buildings (building 201 complex). Since the products, air compressors, reservoirs, automatic brake valves, brake cylinders, brake shoe supports and assembly, and control valves are placed in finished railroad locomotives and cars, they are shipped to the appropriate manufacturers unassembled. Major customers are Pullman, Con-Rail, and Standard. Management operates three shifts, the day shift is the largest; last year production averaged a 6 day work week. Westinghouse Air Brake is a subsidiary of American Standard Corporation and has annual sales of about 145 million.

PROCESS DESCRIPTION

Scrap metal is obtained and melted in the foundry. The molds are built, molten metal poured, and castings shaken out after cooling to the proper temperature. The castings are cleaned and machined to specifications and moved to finish product assembly. Many of the pieces are finish painted at this point, while others have only one protective coat applied. Iron, brass, and aluminum are used most often to make the various products.

For manufacture of products like automatic brake valves, brake cylinders, and control valves, gaskets and other rubber product inserts are used. The inserts are formed to the appropriate shape, sized, inspected, and painted. After the painting process the gaskets are placed into the various products, all products are assembled, finish painted, tested, appropriately labeled, and shipped.

PAINTING OPERATIONS

A. Paint application

Westinghouse Air Brake used about 27,200 gallons of paint of all types last year. Methods of application are airspray, airless, immersion, and brush. Because each part is distinct in itself, painting is accomplished in many different areas as follows:

1. Foundry. Brake reservoirs and parts are sandblasted then spray painted with airless hand-held spray or dipped. The various products are then air dried and loaded onto skids.

2. East Product Shop Two. Reservoirs, ABD cylinders, discs, and miscellaneous parts are either spray painted with air and airless or brush painted. Some operations besides painting are also performed such as assembly, balancing, and stocking finished parts.

3. West Product Shop. Miscellaneous products have various coatings of teflon applied with automatic conventional spray and then are baked dry. Reservoirs, brake beams, ASD body, and ASD main body are brush painted, dipped, or spray painted. Testing, assembly, and stacking operations are also performed by the painter.

4. Rubber Plant. Black urethane seals and cups are spray painted automatically and stacked when dry.

4. Maintenance Shop. Special jobs (non-production items), and lettering are done here. The items are dipped, brush painted or painted with hand-held spray. The painter also sets up stencils, works up designs, and many other miscellaneous procedures before and after painting.

B. Paint Type

1. Foundry. Only alkyd compound 239 is used.

2. East Product Shop Two. Alkyd compound 239, and modified hydrocarbon compounds 30 and 20056 are used.

3. West Product Shop. Teflon compound 16283 and 18198, alkyd compound 239, and modified hydrocarbon compounds 1834, 30, and 20056 are used.

4. Rubber Plant. Urethane compound 16323 and Teflon compound 18198 are used.

5. Maintenance Shop. Urethanes, alkyds, oils, asphalts, and latexs are all used. EZC 4573, 4520, and latex 3470 are the most common paints used here.

Paints in use are from Royston Labs, Pittsburgh, Pennsylvania, Glidden-Durkee, Baltimore, Maryland, Technical Coatings Company, Oakmont, Pennsylvania, and Jamestown Paint and Varnish Company, Jamestown, Pennsylvania.

Paint thinners include the aromatics: xylene and toluene with not more than 1% benzene as a contaminant; the alcohols: ethyl, isopropyl, and carvonyl; the ketones: methyl ethyl and methyl isobutyl; and miscellaneous compounds: alkyl amine, methyl diisocyanate, mineral spirits, and phosporic acid. Representative pigments include titanium dioxide, zinc oxide, aluminum silicate, zinc chromate, and no more than 0.2% organic lead.

DESCRIPTION OF WORKFORCE AND PERSONNEL RECORDS SYSTEM

The plant has a total of 2,600 individuals in production of which an estimated 38 are actually painters. Only one of the painters is a woman. Approximately 3% of the personnel turn-over each year. The records of terminated employees are kept indefinitely, however, it is believed that some of the records were destroyed in the flood. The men work on three shifts with 22 painters on the first shift, 10 on the second, and 5 on the third. They are divided into 5 areas with anywhere from 2 to 7 locations within an area where painting is carried out. Employees other than painters may also be exposed to painting fumes since many of the operations include air drying in the vicinity of other workers. This would be true primarily of the workers who were near the dipping operation. It should be noted that during our visit it was difficult to determine how many workers would actually be involved since on the day of the visit the workforce had been reduced to a skeleton crew because of the snow storm.

The usual employment record or personnel record includes name, address, date of birth and on the old form, nationality, sex, and race. With recent changes in policy these designations have been deleted. The folder also includes the result of the pre-employment physical examination including eye and hearing tests and x-rays. The personnel folder includes all reports of accidents and changes in earnings as well as all job changes. These employment records are kept on all active, terminated, retired and vested employees. There is also a card, the hourly personnel status record with job changes and demographic data, which is kept on each employee and except for a few which were destroyed in the flood, all of the remaining cards have been kept since the beginning of the company over a hundred years ago. These can easily be filmed for recording job changes and dates of such changes. All records from 1969 on have been computerized and individuals who were working in 1969 have been included in that data.

Travelers' Insurance Company carried the life insurance and disability insurance on these individuals. However, retirement has recently been placed in the hands of American Standard. For hourly employees all benefits are non-contributory since 1970; before that there was a contributory pension fund which the individual could draw out at termination. Employees are vested after ten years of service with many receiving full benefits after age 58. Death certificates from life insurance claims are filed with the individual's records in alphabetical order.

DESCRIPTION OF MEDICAL PROGRAM

All employees receive a pre-employment physical in which a preliminary examination is done through the nurses, and doctors complete the examination of chest and lungs. Doctors visit the plant about 6 hours a week. There are two full-time nurses on the day shift and one on each of the other two shifts. Occasionally, the nurse staffs a smaller medical station at the far end of the plant. All guards in the plant are trained in first aid. A log is kept for injuries and the appropriate OSHA forms are filled out in the medical department. The nurses do not dispense safety equipment. Every man who comes in gets a record which is placed in the file and retained since 1974. The number of reportable accidents within the plant is about 40 per month. The nurses estimate that there are about 150 to 222 visits per day made to their clinic along with an average of about 60 physical examinations done per month. If serious injury and accidents occur during a period when the doctor is not available, the nurses send these cases directly to the local hospital.

INDUSTRIAL HYGIENE PROGRAM

The industrial hygiene program has been developing well for the past year. About 15 months ago an industrial hygienist was hired who has implemented several programs to date. Emphasis has been on lead silica, and asbestos hazards. Little seems to have been accomplished in monitoring other hazards so far. Beginning January 1, 1979 Travelers' Insurance Company is handling all insurance needs of the company; prior to 1979 Travelers' handled all insurance but Workmen's Compensation. The insurance companies do not seem to have given the Industrial Hygiene Program much support.

Present practice is to have a once quarterly safety inspection of the whole plant. Monitoring of employees seems to have been accomplished only for lead, silica and asbestos. All ventilation systems are checked as often as possible. Water in the water filtration hoods is changed at least every six months.

Management requires appropriate personal protective equipment such as safety shoes, gloves, shatter proof eyeglasses, smocks, hard hats, chaps, leggings, face shields, tinted goggles, and long sleeves in specified areas such as welding, epoxy application areas, and pouring of molten metal. Helmet liners, hearing protection, and respirators are supplied only to those who so request.

Fork lift drivers are required to take proper training courses and are licensed. First aid training is accomplished outside the plant but only 6 or 7 employees per shift have completed such courses. About three years ago the safety committee was abolished and as yet has not been reestablished.

New employees are oriented to the plant during the first week of employment. Each person is given a personnel manual and all policies are fully explained. This orientation contains mostly classical safety items and not much industrial hygiene.

As respirators are not required, neither is there a respirator maintenance program in force. There are shower and locker room facilities available for employees to use although employees in none of the job categories are required to use them. Although hearing protection is provided to those who so request, no routine audiometric testing is done. Plans for FY80 include implementation of a respirator maintenance program and requiring use of respirators for those jobs involving over-exposure to hazardous materials. Sampling for organic vapors will probably be accomplished to determine where additional personal protective equipment is needed.

DESCRIPTION OF ENGINEERING CONTROLS

Westinghouse Air Brake has installed extensive engineering controls for painting operations throughout the plant in an effort to control exposure so that employees do not have to wear respirators. About 70% of the spray booths and hoods in use seem to be doing an adequate job. See Appendix 2 for the Summary of the Spray Paint Booths in use.

Of the approximate 38 painters employed, about 25% are probably exposed to significant quantities of paint and paint vapor. Additionally some 6-8 non-painters assembling, stacking, and packing painted products are also exposed. The total number of employees consistently exposed would be about 18.

REPRESENTATIVE COATING COMPONENTS

Following is information about paint operations which was summarized by Mr. Mark Jackson. The information provides more detail than that in the description of painting operations. For each operation, at the given location, Mr. Jackson lists:

a. Number of employees exposed
b. Number of employees per shift
c. Number of females
d. Type of painting
e. Type of paint and commodety number
f. Type of controls
g. History of control measures
h. Job descriptions

Foundry

(1) Resevoirs

a. 1 employee
b. 1 employee 1st shift
c. None
d. Airless handheld spray
e. Alkyd commod. #239, thinner commod. #1836
f. Large spray booth with fitters
g. Present controls in use for 5 years prior to this operation did not exist
h. Operator - paints inside of resevoir and pushes out exit of booth

(2) Wheel Tank and Dip Tank

a. 4 employees
b. 2 employees 1st shift, 1 employee 2nd shift and 1 employee 3rd shift
c. None
d. Dipped
e. Alkyd, commod. #239
f. Wheel tanks enclosed and exhausted lateral exhaust hoods on dip tanks
g. Present controls in use for 9 years prior to this no controls in use
h. Operator - loads parts in wheel, dips in paint, removes parts and places on conveyor
Unloader - removes parts from conveyor and stacks on skids: also operates dip tanks - loads baskets, dips in paint, removes baskets, lets air dry, and loads parts onto skids
2nd and 3rd shift operators perform all above mentioned jobs

Number of employees exposed	5
Number of females	0
Number of employees 1st shift	3
Number of employees 2nd shift	1
Number of employees 3rd shift	1

East Product Shop Two

(1) Reservoirs

a. 3 employees
b. 1 employee all three shifts
c. None
d. Airless handheld spray
e. Alkyd, commod. #239
f. Large spray booth with waterfall
g. Present controls in use for 30 to 40 years
h. Operator - assembles resevoirs and paints

(2) ABD Cylinders

a. 3 employees
b. 1 employee all three shifts
c. None
d. Airless handheld spray
e. Alkyd, commod. #239
f. Large spray booth with waterfall
g. Present controls in use for 4 years,
prior to this a similar booth was in use for 30+ years
h. Operator - assembles cylinders and paints

(3) Miscellaneous

a. 3 employees
b. 1 employee all three shifts
c. None
d. Conventional hand held spray
e. Alkyd, modified hydrocarbon commod. #'s 30, 20056, 239
f. Large spray booth with filters
g. Present controls in use for 6 years,
prior to this a similar booth was used for 30-40 years
h. Operator - paints and stacks parts

(4) Disc

a. 2 employees
b. 2 employees 1st shift
c. None
d. Brushed
e. Modified hydrocarbon, commod. #'s 30 and 20056
f. No controls
g. No controls
h. Operator - balances and paints discs

Number of employees exposed	11
Number of females	0
Number of employees 1st shift	5
Number of employees 2nd shift	3
Number of employees 3rd shift	3

West Product Shop

(1) Teflon Green

a. One employee
b. One employee 1st shift only
c. None
d. Automatic conventional spray
e. Teflon, commod. #16283
f. Spray booth with filters
g. Present controls in use for 20 yrs.; prior to this, painted by conventional handheld in booth
h. Operator - blast parts in blast cabinet, paints and bakes in oven 1st coat bakes 20 min. at 400°F

(2) Teflon Clear

a. One employee
b. One employee 1st shift only
c. None
d. Automatic conventional spray
e. Teflon, commod. #16284
f. Spray booth with filters
g. Present controls in use for 20 yrs.; prior to this, painted by conventiaonl handheld in booth
h. Operator - paints and bakes parts in oven, 2nd coat bakes 10 min. at 800°F

(3) One Coat Teflon

a. Either of the two employees mentioned under 1 and 2
b. 1st shift
c. None
d. Automatic conventional spray
e. Teflon, commod. #18198,
thinner commod. #18199
f. Spray booth with filters
g. Booth and operation in use for one year
h. Operator paints and bakes in oven

(4) Reservoirs

a. Two employees
b. One 1st shift and 1 2nd shift
c. None
d. Dipped and brushed
e. Modified hydrocarbon, commod. #1834
f. No controls
g. Operation in effect for >30 years
h. Operator tests, paints, siphons, bakes and stacks reservoirs

(5) Wabcopac Brake Beams

a. 2 employees
b. 2 1st shift only
c. None
d. Dipped
e. Alkyd, commod. #239
f. Lateral exhaust hood over dip tank; lateral exhaust hood beside drying beams
g. Dip tank exhaust in use for 20 years, beam drying hood in use for 6 mos.
h. Operator - removes beams from dip tank, stacks on skids; beam assembler - partially assembles beams and dips in tank

(6) ABD Body

a. 3 employees
b. 1 each shift
c. None
d. Conventional handheld spray
e. Modified hydrocarbon, commond. #30 & 20056
f. Spray booth with waterfall
g. Present booth in use for 1 1/2 hrs.; prior to this a similar booth with filter was used
h. Operator - assembles ABD, paints and stacks on skids

(7) ABD Main Body

a. Two employees
b. One 1st and one 2nd shift
c. None
d. Airless spray handheld
e. Alkyd, commod. #239
f. Small spray booth with filters
g. Present booth in use for 15 yrs.; prior to this painted in Sect. 9 with urethane, same booth
h. Operator - paints ABD bodies and stacks on skids

Number of employees exposed	11
Number of females	0
Number of employees 1st shift	7
Number of employees 2nd shift	3
Number of employees 3rd shift	1

Sect. 52 (Rubber Plant)

(1) Black Urethane

a. Six employees
b. Three employees 1st and 2nd shift
c. One
d. Automatic conventional spray
e. Urethane, commod. #16323
f. Spray booth with filters and exhausted drying tunnel
g. Present controls in use for 15 yrs.; prior to this, operation did not exist
h. Operator - fills guns with paint and and adjusts guns as necessary urethane helpers - (a) place cups on racks, (b) remove cups from racks and places in air jet cabinet, removes and stacks in boxes

(2) Teflon

a. Same employees as above
b. Same as above
c. One
d. Automatic conventional spray
e. Teflon, commod. #18198, thinner #18199
f. Spray booth with filters
g. Present controls in use for 14 yrs.; prior to this operation didn't exist
h. Operator - fills guns with paint and adjusts as necessary

Number of employees exposed	6
Number of females	1
Number of employees 1st shift	3
Number of employees 2nd shift	3
Number of employees 3rd shift	0

Section 8

1. Urethans, alkyd, oil, asphalt, latex - alkyd used most often - 4 men fulltime - dipped, brushed, rolled, and conventional spray

   Maintenance employees job includes painting offices to painting parts, no females, all 1st shift

   Controls in use

   1. Spray booth
   2. Paint spray respirators
   3. Fans

   Fulltime - 4

CONCLUSIONS

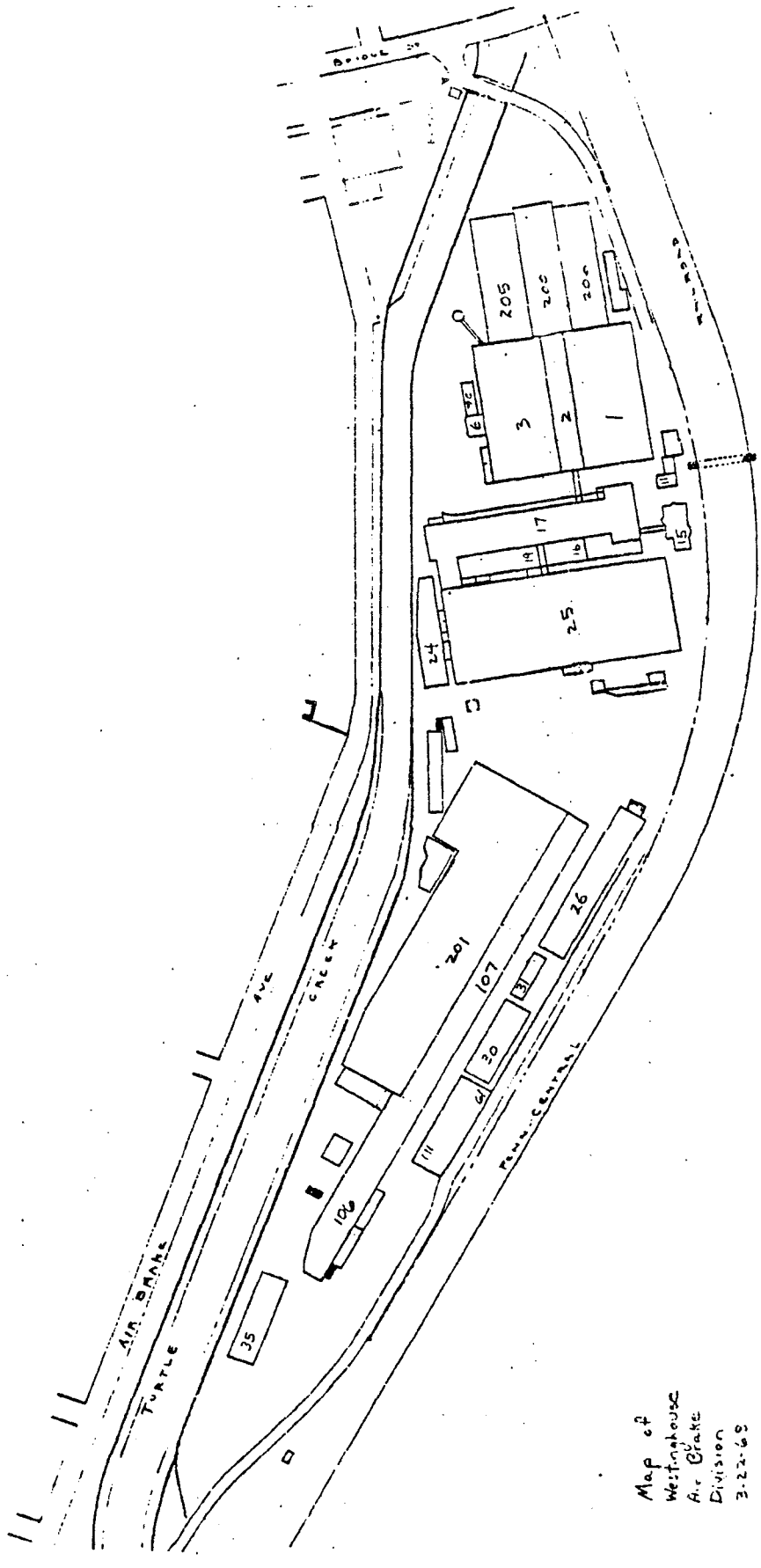
Even though painters have excellent controls for removal of paint and paint vapor, potential exposure of up to 18 employees was observed. The process is consistent, employees spend the greatest percentage of their day in and near painting, and the work load within the plant appears very stable.

WABCO has an excellent record system which allows identification of employees over several years. The exposure of many additional employees in areas where painting is done would increase the potential number in the population for study. This would be an appropriate site for an in-depth study of potential hazards of painting in this industry.

RECOMMENDATION

Consider this site for an in-depth study of potential hazards of painting.

APPENDIX 1



Map of Westinghouse Air Brake Division 3-22-68

APPENDIX 2

Table

SUMMARY OF PAINT SPRAY BOOTHS

No.	Title	Approximate Spray Booth Size or Description	Efficiency*	No. of Employees probably exposed **
1	Reservoirs	4 x 4 x 6'	Marginal	1 (1)
2	Wheel Tank	small, enlcosed	Good	0 (1)
3	Dip Tank	Large, slot	Marginal	1
4	Reservoirs-2	8 x 8 x 12'	Good	0
5	ABD Cylinders	8 x 8 x 12'	Good	0
6	Miscellaneous	6 x 12 x 8'	Good	0
7	Disc	None	Poor	2
8	Teflon Screen	Small	Adequate	0
9	Teflon Clear	Small	Adequate	0
10	One Coat Teflon	Small	Adequate	0
11	Reservoirs - West	None	Poor	2
12	Wabecopac Drums	Slot	Very Poor	2 (2)
13	ASD Body	6 x 8 x 7'	Good	0
14	ABD Main Body	4 x 4 x 3'	Good	0
15	Black Urethane	6 x 4 x 6'	Good	0 (1)
16	Teflon-Rubber	3 x 4 x 4'	Good	0 (1)
17	Maintenance	7 x 8 x 12'	Good	1

* Merely a guestimate based on direction of vapor or inefficiency of system.

** Only painters. Parenthesis indicates non-painters potentially exposed.