PLAINTIFF'S EXHIBIT
AL-48

INDEX

ARD 002849

INDUSTRIAL HYGIENE "

ALCOA, ROCKDALE

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Dr. Washam

A. G. CLAYTON
J. DAMIANO
E. B. PARKER

MEMORANDUM

1983 January 12

RE: EVALUATION OF CATCO SYSTEM - ROCKDALE WORKS

Abstract

Air samples were collected on 1982 August 31 and September 01 to determine the effectiveness of the Catco System for reducing crane operator exposure to fluorides. The test results indicate that the Catco System offers substantial reductions in breathing zone air contaminant concentrations. Lower protection efficiencies were observed in some samples that can be explained by the horizontal movement of the crane, breaking the air curtain, and hood aprons that were not entirely in place.

Temperature measurements were also made. The substantially cooler temperatures under the air hood suggest a general improvement in working conditions for the crane operators. This is borne out by the many positive comments by the employees. In addition, potroom supervisors have described significant improvements in productivity following installation of the Catco System.

Description

The Catco System provides positive local ventilation to crane operators without the problems associated with an enclosed crane cab. The system was manufactured by the Crane Air Trac Company of Burlington, Ontario.

Figure 1, although not exactly the Rockdale installation, shows how the concept works. At Rockdale Works, equipment rooms located in the courtyards between the potrooms draw in outside air and deliver cooled, conditioned air to a rectangular duct running the length of each potroom. The bottom of this duct is slotted and equipped with a special seal which allows each crane to tap into the duct. Air is delivered through a tube to a circular diffuser mounted above the crane operator's seat. An air curtain is formed at the perimeter of the diffuser and conditioned air is introduced inside this curtain to flush out potroom gases. About 500 cfm of conditioned air is delivered to the crane cab at temperatures which vary depending upon ambient conditions. Some degree of comfort control is provided by means of a thermostatically controlled electric heater in the diffuser. Photograph 1 depicts a typical crane cab installation.

The Catco System was selected as the most cost effective solution to reducing crane operator exposure to gaseous and particulate fluoride. Enclosed air conditioned crane cabs were considered but not selected due to problems in maintaining visibility for the operator and difficulties in maintaining each air conditioning unit. The Catco System provides nearly unimpeded mobility for the operator with no obstruction of vision. Fewer maintenance difficulties are anticipated in comparison to individually air conditioned crane cabs.

Methods

Air samples were collected simultaneously under the air hood, close to the operator's breathing zone (Photograph 2), and outside the hood. The "cab" sample was positioned far enough from the hood to avoid the effect of fresh air, but close enough to give a reasonable approximation of the air contaminant concentrations in the area of the crane. The "cab" air sampling instruments were positioned near the ladder (Photograph 3) or on the superstructure of the Catco hood (Photograph 4).

Each potroom has two cranes. The sampling instrumentation was mounted on the crane (east or west) intended to be used more often by the crane operator. The air sampling was performed by Jim Richter, Leon Young, and Joe Damiano. The samples were analyzed in the Rockdale Works Laboratory for total particulate, particulate fluoride and gaseous fluoride.

Results and Observations

The test results are shown in Tables 1 and 2. Each table lists the air contaminant concentrations in the "Hood Interior" and for the "cab" (outside the hood). A "percent efficiency" was calculated for each crane in the study.

Example:

Room 26 West Crane sample (1982 August 31)

	Gaseous Fluoride (mg/m^3)
Cab:	2.619
Hood Interior:	0.520
DIFFERENCE	2.099 ÷ 2.619 X 100 = 80.1% efficiency

The permissible exposure limit for fluorides (gaseous and particulate) is 2.5 mg/m^3, as an eight hour average. This particular hood offered a major reduction in gaseous fluoride concentrations from 2.6 mg/m^3 to 0.5 mg/m^3, an 80.1% efficiency. Tables 1 and 2 suggest that the Catco System offers effective protection for gaseous and particulate fluoride exposure.

The distribution of "percent efficiencies" is shown in Table 3. The variation is probably due to the movement of the crane. The fresh air curtain is broken when the crane is moved. Additionally, on 1982 September 01, the air hood canvas apron was rolled up on the Room 6 East Crane and the Room 22 West Crane, probably resulting in the lower efficiencies revealed through our air sampling.

Prior to the survey, we observed a few crane operators leaning forward and outside of the air curtain perimeter. This problem can be solved by moving the hood forward on its tracks. It is important for each operator to adjust the hood to his or her size and posture.

Temperature Measurements

Temperature measurements were taken in conjunction with the air samples. Wet bulb measurements were made under the Catco hood and on the crane outside the hood with a Reuter Stokers Model R55-211D "WIBGET" heat stress monitor (Table 4). Earlier measurements made by Jim Richter (1981 September 08) are included (Table 5).

The wet bulb temperature measurements reflect reductions in convective heat and humidity; however, the data should not be interpreted as measures of heat stress. Even without the air hoods there is not a "heat stress" hazard for the crane operators because their work involves minimal physical effort. Accordingly, the temperature measurements should be considered in terms of comfort. The cool air certainly represents a general improvement in working conditions for the crane operators. This is borne out by the many positive comments from employees. In addition, potroom supervisors have described significant improvements in productivity following installation of the Catco System.

Please contact us with any questions that you may have.

A. G. CLAYTON J. DAMIANO E. B. PARKER

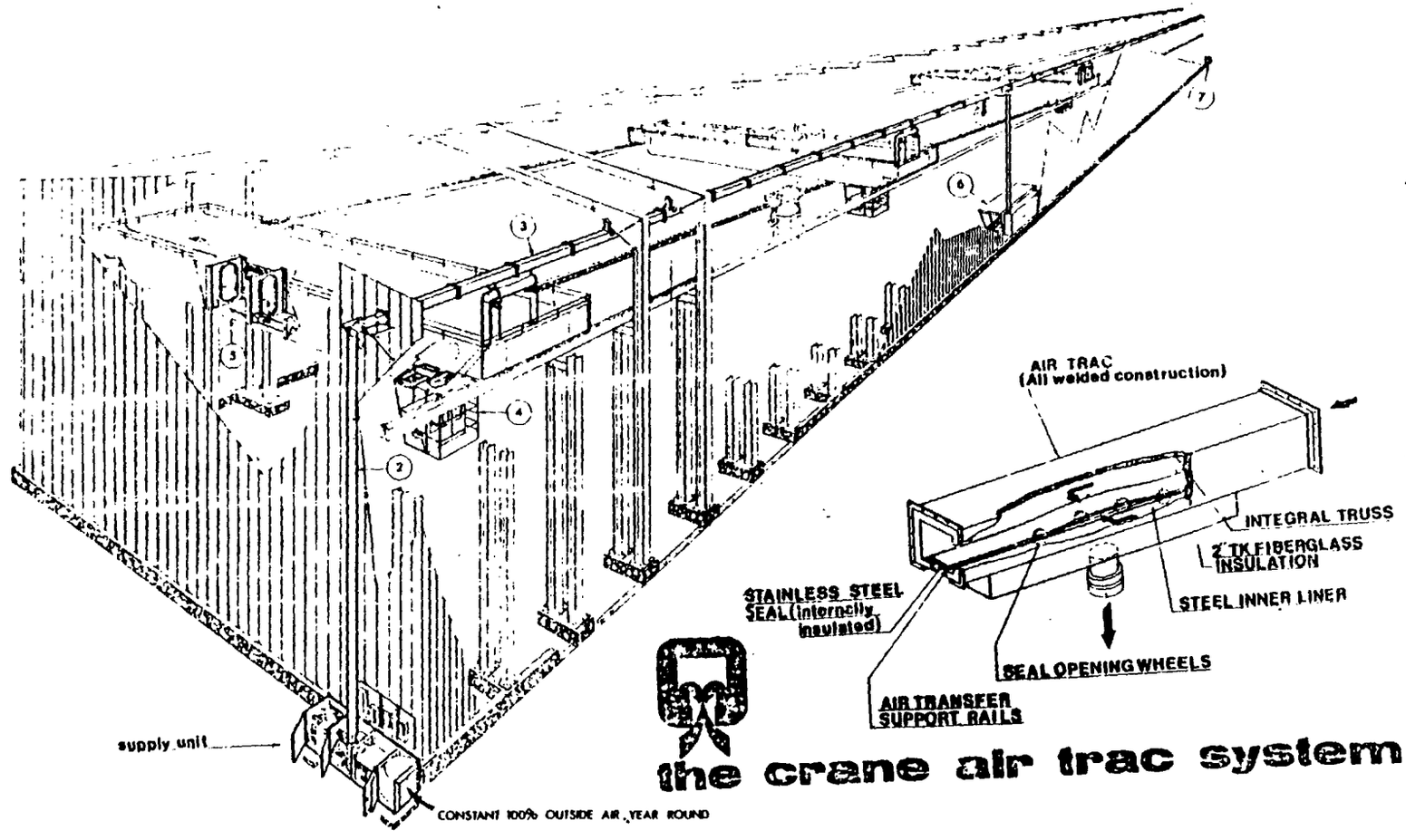
AGC:JD:EBP:cch

Attachments

Copies:

Mr. J. Richter - Rockdale Works
Mr. L. Young - Rockdale Works
Mr. G. H. Lantz - Rockdale Works
Mr. J. L. Roddy - Rockdale Works
Mr. J. W. Havins - Rockdale Works
Mr. W. J. Drake - Rockdale Works
Dr. W. T. Washam - Rockdale Works
Dr. L. F. Schaller - Point Comfort Operations
Mr. L. F. Wagner - Point Comfort Operations
Mr. T. R. Johnny - Pittsburgh
Mr. E. E. Rumberger - Pittsburgh 06

series xx1500 stainless steel seal
air trac



the crane air trac system

FIGURE 1

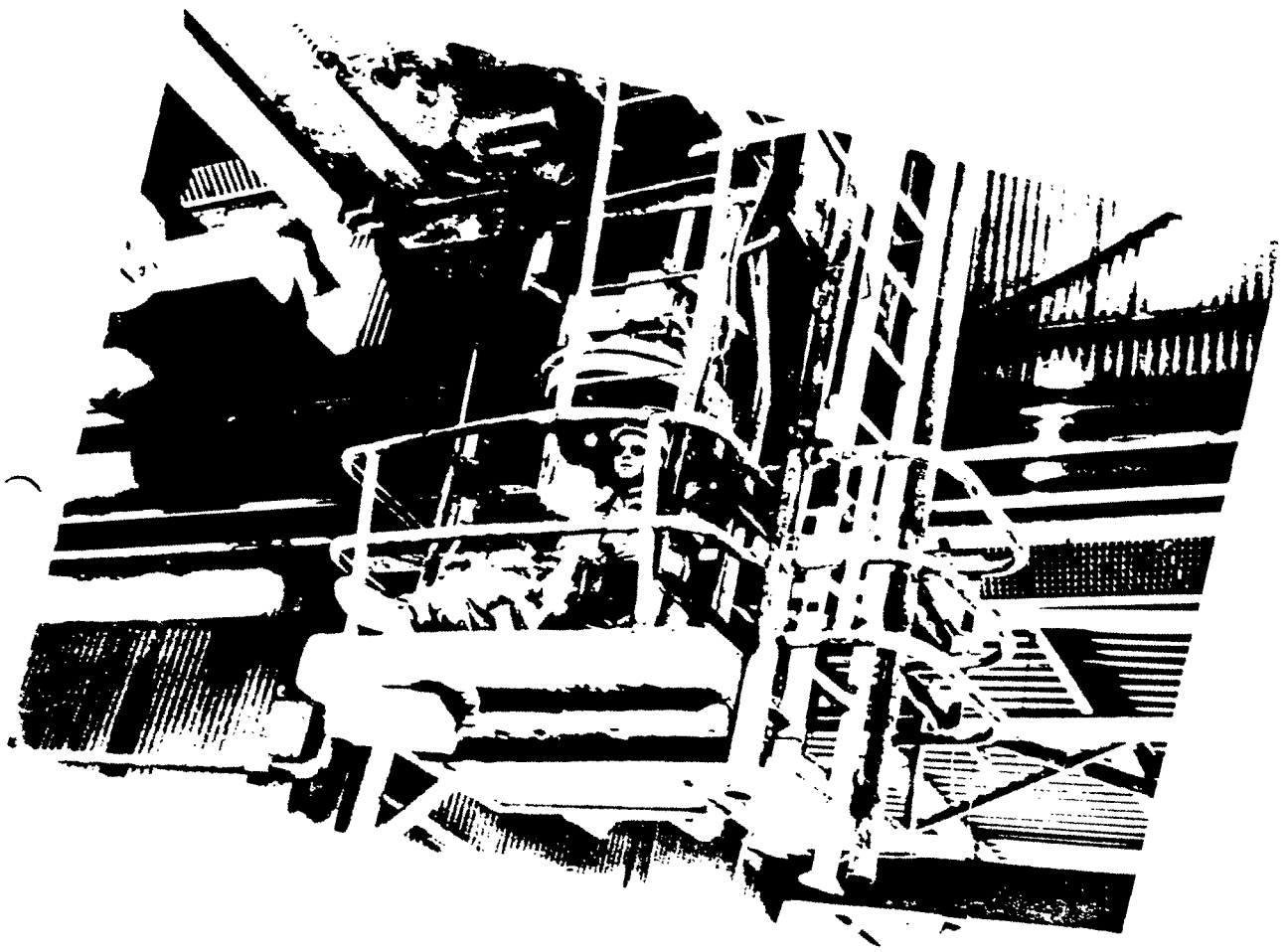
ARD 002855



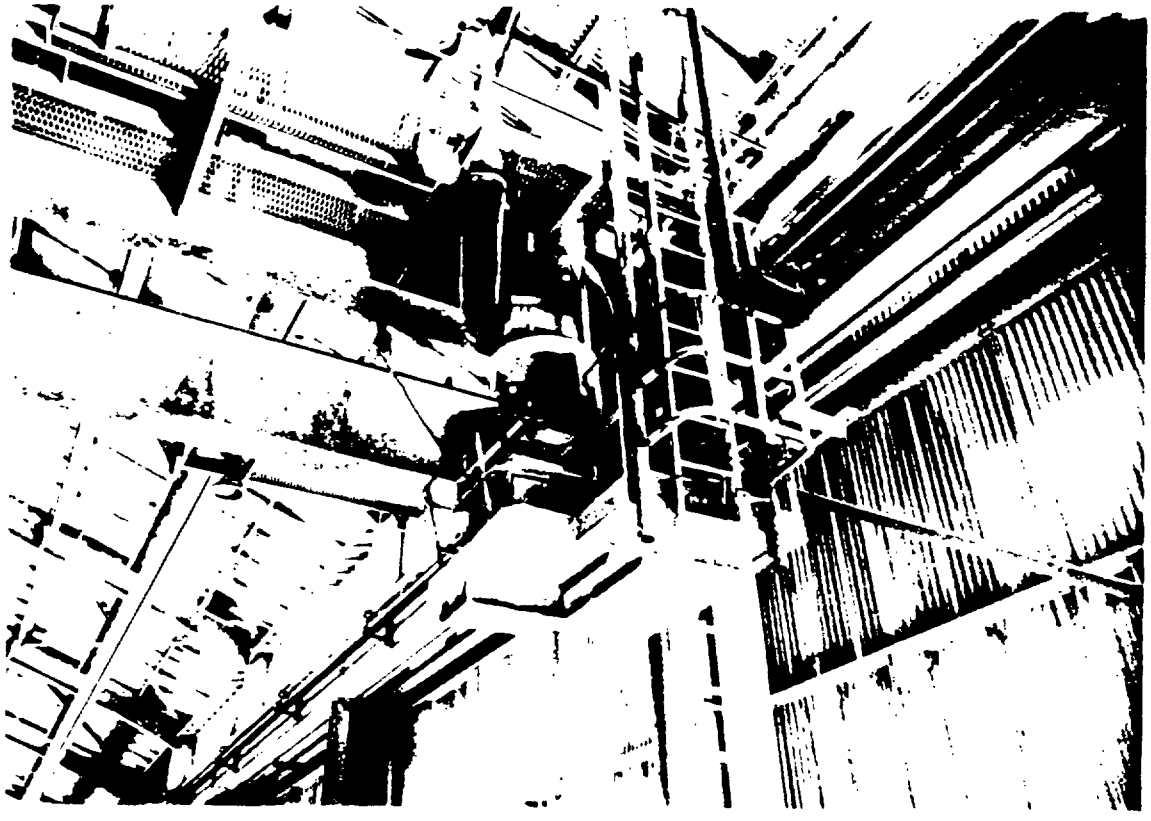
Photograph 1



Photograph 2



Photograph 3



Photograph 4

Table 1

CATCO SYSTEM EVALUATION ANALYSIS

1982 AUGUST 31

ROOM NO.	CRANE	TOTAL PARTICULATE*			FLUORIDE (PARTICULATE)**			FLUORIDE (GASEOUS)**		
		HOOD INTERIOR	CAB	% EFFICIENCY	HOOD INTERIOR	CAB	% EFFICIENCY	HOOD INTERIOR	CAB	% EFFICIENCY
6	WEST	0.47	1.30	63.8	0.107	0.498	78.5	0.217	1.063	79.6
14	WEST	1.14	4.75	76.0	0.248	0.931	73.4	0.353	1.882	81.2
20	WEST	0.78	4.27	81.7	0.214	0.731	70.7	0.280	1.114	74.9
22	WEST	1.73	3.45	49.9	0.364	0.602	39.5	0.812	1.618	49.8
24	WEST	0.11	3.28	96.6	0.083	0.518	84.0	0.070	1.465	95.2
26	WEST	0.75	2.86	73.8	0.250	0.699	64.2	0.520	2.619	80.1
128	WEST	1.37	2.37	42.2	0.062	0.319	80.6	0.034	0.727	95.3
130	WEST	1.33	10.67	87.6	0.121	0.690	82.5	0.132	0.850	84.5
132	EAST	0.52	3.70	85.9	0.160	0.283	43.5	0.224	0.574	61.0

*CONCENTRATIONS ARE EXPRESSED IN MILLIGRAMS PER CUBIC METER.

**ALL CONCENTRATIONS ARE EXPRESSED IN MILLIGRAMS HYDROGEN FLUORIDE (HF) PER CUBIC METER.

ARD 002860

1982 SEP 27

A. G. C.

CATCO SYSTEM EVALUATION ANALYSIS

1982 SEPTEMBER 01

ROOM NO.	CRANE	TOTAL PARTICULATE*			FLUORIDE (PARTICULATE)**			FLUORIDE (GASEOUS)**		
		HOOD INTERIOR	CAB	% EFFICIENCY	HOOD INTERIOR	CAB	% EFFICIENCY	HOOD INTERIOR	CAB	% EFFICIENCY
4	WEST	0.19	1.93	90.2	0.042	0.216	80.6	0.077	0.821	90.6
6	EAST	1.27	2.29	44.5	0.263	0.247	-6.5	0.458	0.414	-10.6
12	EAST	0.27	4.69	94.2	0.181	0.803	77.5	0.282	2.895	90.3
14	WEST	0.11	2.91	96.2	0.090	0.814	88.9	0.132	2.857	95.4
20	WEST	1.93	2.74	29.6	0.346	0.425	18.6	0.830	1.141	27.3
22	WEST	1.47	1.91	23.0	0.373	0.488	23.6	1.400	1.418	1.3
130	WEST	0.96	2.45	60.8	0.073	0.352	79.3	0.043	0.526	91.8
132	EAST	1.46	2.35	37.9	0.131	0.754	82.6	0.246	1.786	86.2
134	WEST	0.57	2.49	77.1	0.044	0.245	82.0	0.056	1.051	94.7

*CONCENTRATIONS ARE EXPRESSED IN MILLIGRAMS PER CUBIC METER.

**ALL CONCENTRATIONS ARE EXPRESSED IN MILLIGRAMS HYDROGEN FLUORIDE (HF) PER CUBIC METER.

ARD 002861

TABLE 3

DISTRIBUTION OF PERCENT EFFICIENCIES
CATCO SYSTEM EVALUATION

SURVEY DATES: 1982 August 31 and September 01

% Efficiency Range	Total Particulate	Particulate Fluoride	Gaseous Fluoride
91-100	3	0	6
81- 90	4	5	4
71- 80	3	7	3
61- 70	2	1	1
51- 60	0	0	0
41- 50	3	1	1
31- 40	1	1	0
21- 30	2	1	1
11- 20	0	1	0
0- 10	0	0	1
<0	0	1	1

JDamiano:gac
1982 November 05

ALUMINUM COMPANY OF AMERICA

ROCKDALE WORKS LABORATORY

REPORT TO	DATE	REPORT NO.
JOE DAMIANO, POINT COMFORT	82-09-02	1113-H

SAMPLE OF TEMPERATURE

RECEIVED FROM

COPIES TO E. B. PARKER

DESCRIPTION WET BULB TEMPERATURE READINGS TAKEN IN POTROOM CRANE CABS.

CRANE	ROOM NO.	TIME	DATE	LOCATION OF CRANE	TEMPERATURE UNDER CATCO HOOD	TEMPERATURE OUTSIDE CATCO HOOD INFLUENCE
WEST	12	1300	82-08-31	POT #40	76.5 °F	83.2 °F
				55	77.4	85.8
				71	83.5	86.1
EAST	20	1050	82-08-31	1	77.5	85.0
				24	77.0	86.3
				36	77.0	86.3
				45	78.1	87.0
EAST	24	1120	82-08-31	3	72.6	86.0
				20	69.5	87.4
				41	70.5	86.2
WEST	128	1330	82-08-31	42	66.0	88.0
				53	66.0	86.5
				63	70.2	87.3
				79	72.1	87.4
WEST	24	1320	82-09-01	10	73.4	87.6
				31	66.9	87.4
EAST	130	1210	82-09-01	4	73.1	88.0
				23	67.0	88.7
				40	63.2	90.1
WEST	134	1250	82-09-01	52	66.0	87.1
				65	69.3	87.3
				76	70.2	86.6

ARD 002863

1982 SEP 0 8

ANALYZED BY _____ APPROVED BY A. G. C.

SF-1633 (REV. 6-62)

REPORT TO	DATE	REPORT NO.
S. J. SPELL	81-09-08	7166-E

SAMPLE OF AIR TEMPERATURE

RECEIVED FROM

COPIES TO E. B. PARKER

DESCRIPTION READINGS TAKEN ON 81-09-01 FROM THE MAINTENANCE BRIDGE OF THE EAST CRANE IN ROOM 22 AT THE BELOW LISTED LOCATIONS.

		Ambient		Room 22 Temperatures			Dry Bulb
Time	Location	Temp	Relative Humidity	Dry Bulb	Wet Bulb	Globe Bulb	Crane Cab w/CATCO
1355	East Passageway	92°F	56%	118°F	86°F	119°F	96°F
1410	Pot #1	94	54	117	87	120	98
1425	Pot #12	93	53	133	89	135	104
1445	Pot #24	95	55	131	89	134	102
1500	Pot #36	95	55	131	89	134	99

ARD 002864

1981 SEP 14

ANALYZED BY [signature] APPROVED BY A. G. L.

SF-1633 (REV. 6-62)

W. Thomas Washam, M.D.
Rockdale Works

Industrial Hygiene Technical Bulletin

No. 83-1

Date: 1983 February 09

RE: VANADIUM EXPOSURES - No. 6 (BUNKER C) FUEL OIL
Ref. Industrial Hygiene Safeguards

Periodically, boilers must be shut down to remove the scale that accumulates on the tubes. This removal can be a very dusty operation. Boilers fired with No. 6 (Bunker C) fuel oil can present a significant employee exposure to vanadium pentoxide for those engaged in the cleaning process. Even though vanadium levels in fuel oil can vary, employee exposures to vanadium compounds can be quite excessive regardless of the levels of vanadium present in the feed stock oil. Some personal samples reflecting employee exposure levels during boiler clean-out have ranged as high as 13.5 mg/M^3 for vanadium pentoxide. Vanadium levels in the parent fuel oil were only 70 ppm where these airborne exposures occurred.

Certain vanadium compounds (e.g. V_2O_5) are quite toxic by inhalation. Severe upper respiratory tract irritation, bronchitis, emphysema, pulmonary edema, etc. may be observed. For these reasons, we recommend the following Alcoa exposure limit for vanadium compounds:

0.05 mg/M^3 - respirable dust and fume (as V_2O_5) - time weighted average.

As a reminder, OSHA has established a ceiling limit of 0.50 mg/M^3 (as V_2O_5) for total vanadium dust and a ceiling limit of 0.10 mg/M^3 (as V_2O_5) for total vanadium fume. The Mine Safety and Health Administration (MSHA) limits dictate a ceiling limit of 0.05 mg/M^3 (as V_2O_5) for total vanadium fume.

In light of the above, we recommend that you practice the following safeguards when No. 6 fuel oil boiler clean-out takes place.

1. Work practice controls (i.e. dust suppression techniques, exhaust ventilation, etc.) to minimize employee exposure to boiler dust is recommended where feasible and necessary. The following controls which were developed by Pittsburgh's Power Engineering Division are advised:

   A. The cleaning of boiler tube surfaces prior to any employee exposure is recommended. Procedures to accomplish this include the following:

      (1) Prior to removing the boiler from service, all sootblowers should be operated through a complete cycle to clean tube surfaces as best as possible.

(2) Water washing with sootblowers as the boiler is being brought out of service can be tried. Plant condensate would be acceptable to use. The water pressure should be in the 200-400 psi range. Where appropriate, tube metal temperatures should be sufficiently reduced before water washing, typically no greater than 265°F. This has proven to be an ideal tube metal temperature limit for this water wash procedure to be effective.

(3) In the event that tube surfaces still contain large amounts of dusty, friable ash after the boiler is taken out of service, a manual water wash may be done with the following conditions.

(a) A high pH water is used; i.e., pH in the range of 10-11. Plant condensate should be able to meet this requirement.

(b) As soon as possible after work is completed, water should be drained and the unit thoroughly dried out.

B. Local exhaust ventilation employing portable Venturi-jet type exhausters placed at upper level manholes should also be considered where necessary to reduce excessive dust levels. However, the exhaust from these portable blowers will need to be "piped" away from any occupied areas to avoid exposing other personnel.

2. NIOSH-approved respiratory protection for toxic dusts should be worn when the potential for exceeding the above exposure limits for vanadium exists. Due to the irritative properties of boiler dust, we recommend full face respiratory protection. Moreover, past industrial hygiene exposure measurements for vanadium when boiler clean-out has occurred have indicated that air purifying respiratory protection may not provide an adequate margin of safety. Respirators with a higher protection factor (i.e. supplied-air respirators) appear justified in most instances. These factors, coupled with your particular exposure potential, should be kept in mind when deciding what type of respiratory protection to select for your given situation.

3. Where appropriate, adequate personal protective equipment (i.e. disposable coveralls, eye protection) to minimize skin and eye contact with boiler soot as well as the water used for dust suppression is recommended due to their corrosive properties.

4. It is suggested that employee sampling for vanadium exposures be conducted the next time boiler clean-out takes place.

If you have any questions concerning the above, please advise.

ROBERT M. JAMES

RMJ:lmn

Distribution: I.H. Distribution List

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D. E. Jones, Pittsburgh WP5
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J. R. Lynch, Pittsburgh WP5
J. R. Mitchell, Pittsburgh 19AB
J. G. Nelson, Pittsburgh WP5

ALUMINUM COMPANY OF AMERICA

ROCKDALE WORKS LABORATORY

REPORT TO	DATE	REPORT NO.
E. B. PARKER	83-02-10	1018-H

SAMPLE OF AIR

RECEIVED FROM

COPIES TO DR. W. T. WASHAM, W. T. ECKERT, C. P. KOUBA, A. GLASER

DESCRIPTION AREA SURVEYS FOR MERCURY VAPOR.

ON 1983 FEBRUARY 07 A QUALITATIVE ANALYSIS FOR MERCURY VAPOR WAS PERFORMED USING A JEROME INSTRUMENT CORPORATION GOLD FILM MERCURY VAPOR ANALYZER, MODEL 401, IN THE FOLLOWING AREAS:

1. RECTIFIER STATION, LOWER LEVEL, LUNCHROOM
2. RECTIFIER STATION, LOWER LEVEL, IMMEDIATE WORK AREA OUTSIDE LUNCHROOM
3. RECTIFIER STATION, UPPER LEVEL, METER SHOP

AREAS TESTED WERE DRAINS, BEHIND AND UNDER CABINETS, REFRIGERATORS, STOVES, WORK TABLES, AND ALONG BASEBOARDS.

NO MERCURY VAPORS WERE DETECTED IN ANY OF THE AREAS TESTED.

NOTE:

1. INSTRUMENTS BORROWED FROM ALCOA TECHNICAL CENTER.
2. A POSITIVE RESPONSE WAS OBTAINED WHEN THE INSTRUMENT WAS EXPOSED TO AN OPEN BOTTLE OF MERCURY.

1983 FEB 14

ANALYZED BY cmk Jim Richter APPROVED BY A. G. C.

SF-1633 (REV. 6-62)

ARD 002868

ROCKDALE WORKS
INDUSTRIAL HYGIENE

RULE NUMBER	
I-004	
DATE	
1983 April 29	
REPLACES RULE NO.	OF DATE(S)

RE: HAZARDOUS MATERIALS HANDLING COMMITTEE POLICY ON CONTAINER DISPOSAL

Rockdale's container disposal policy is summarized below.

Empty Containers Approved For Release To Employees

Type Container	Material Contained
Fiber Drum	Tabular Alumina
Fiber Drum	Activated Alumina
Plastic Pail	Soap
Plastic Pail	Refractory Cement (Penseal 25)
Fiber Drum	Graphite

Supervisors are responsible for insuring that containers to be taken are clean. Their signature on the gate pass attests to the fact that they have inspected and released the containers.

It is important that this inspection be thorough in order to avoid incidents which could result in liability claims.

No metal containers are on the approved list.

Persons desiring to add specific containers to the approved list should contact the Hazardous Materials Control Committee.

Empty Metal Container Disposal

Returnable empty metal containers are accumulated in a designated area in the south yard and sold to a D.O.T.-approved reclaimer.

Non-returnable metal containers are accumulated in a separate area in the south yard for ultimate disposal in the Class II landfill. Disposal is accomplished by taking accumulated containers to the landfill at a time when the area is being worked on by IGC's bulldozer. This will facilitate immediate crushing and covering of the containers.

Accumulated metal containers are not to be released for any use inside or outside the plant fence because of potential chemical exposure hazards and because severe explosions and/or subsequent fires may result if welding, cutting, or other hot work is done on containers that my not be entirely free of combustible solids, liquids, vapors, dusts and gases.

FROM E. BROOKS PARKER

ROCKDALE WORKS

TO HOLDERS OF ROCKDALE WORKS SAFETY MANUAL

1983 July 15

RE: INDUSTRIAL HYGIENE RULE I-000

Attached is a revised Frequency of Training table for the referenced rule. The table has been changed to indicate a respiratory protection training requirement for the Atomizer.

Please insert the new table in your manual and destroy the old one.

E. BROOKS PARKER

EBP/mz

Attachment

cc:
J. E. Richter

ARD 002870

ALCOA

ATTACHMENT B

Frequency of Training

	Hearing Conservation	Respiratory Protection	Fluoride	PCB's	Chlorine	$SiCl_4$	Radiation
Carbon Plant	1/yr	1/yr	-	-	-	-	-
Rodding	1/yr	-	-	-	-	-	-
Potrooms	1/yr	1/yr	1/yr	-	-	-	-
Ingot Plant	1/yr	-	-	-	2/yr	2/yr	-
Properzi	1/yr	-	-	-	2/yr	-	-
Atomizer	1/yr	1/yr	-	-	-	-	1/yr
Potlining	1/yr	1/yr	1/yr	-	-	-	-
Environ. Control	1/yr	1/yr	1/yr	-	-	-	-
Potroom Control/ Utility	1/yr	1/yr	1/yr	-	-	-	-
Maint.	1/yr	1/yr	1/yr	1/yr	2/yr	2/yr	-
Medical	-	-	-	-	-	-	1/yr

ARD 002871

Engineering Standard

ALCOA

Materials and Standards Section · Pittsburgh

~~Bill Eckert~~

35.4.9

PAGE 1

1982-03

Tom Washam

POLYCHLORINATED BIPHENYLS (PCBs)

To MED DEPT STAFF — FYI

For your information

Brooks

This standard is the property of Aluminum Company of America and must be returned on request. It shall not be reproduced or copied, in whole or in part, or used on behalf of others than Aluminum Company of America or its subsidiaries, without permission. This engineering standard is provided solely for the purpose of disclosing Alcoa's approach, and is not intended to be a recommendation for any recipient other than Alcoa. No warranties, guarantees or representations, express or implied are made as to the utility or effectiveness of the methods, processes, products or procedures described or recommended herein.

1.0 SCOPE

This standard provides a brief history of the usage of PCBs in the United States, the action taken by the U.S. Government to have them eliminated from our environment, and Alcoa's past and future responses to the problems which PCBs have created.

2.0 ORIGIN OF PCBs

2.1 The polychlorinated biphenyls constitute a family of organic chemicals. They were originally developed, manufactured, and sold in the U.S. by Monsanto Chemical Co. of St. Louis, Mo. starting in 1936. Their use in products continued until the third quarter of 1977. On 1979-05-31 any future manufacture of them in the U.S. became illegal.

2.2 Monsanto sold the PCBs under their trade name Aroclor 1248, 1252, etc. When they were incorporated in a product made by someone other than Monsanto, their presence in the finished product may not have been identified or acknowledged.

2.3 Within Alcoa's manufacturing facilities, the PCBs are most apt to be present in the following materials:

1. Electrical capacitors
2. Transformer dielectric fluid
3. Phosphate ester type fire resistant hydraulic fluids
4. Oil filled circuit breakers
5. Hot oil heat transfer systems

3.0 GOVERNMENTAL REGULATION OF THE PCBs

3.1 The toxic characteristics of PCBs were unrecognized until the late 60's and early 70's. Then, research biologists and environmentalists were beginning to identify the potential danger that these chemicals presented to the environment. They also discovered the more heavily chlorinated PCBs to be environmentally persistent and bioaccumulative to some degree.

3.2 Congress has now mandated that PCBs be located, controlled, and ultimately destroyed. Authority has been awarded to the Environmental Protection Agency to establish the necessary rules and procedures for eliminating these controversial chemicals from our environment.

3.3 Alcoa's objective is to work with the Environmental Protection Agency in developing the details of the regulation so that PCBs can be promptly handled and carefully removed from our processes.

3.4 The remainder of this standard will highlight activities in the major areas of concern to Alcoa.

4.0 PROTECTION OF ALCOA PERSONNEL WHILE HANDLING PCBs

4.1 Employees handling PCB-contaminated fluids should use good personal hygiene practices to minimize skin and eye contact since PCBs are readily absorbed through the skin and eyes. Appropriate impervious protective clothing should be used by employees engaged in work assignments where skin and/or eye contact with PCB-contaminated fluids is possible. Employees who have had potential skin exposure to fluids containing PCBs should be advised to wash before eating, drinking, smoking, or using toilet facilities.

4.2 Air exposure to PCBs is not likely to present a health hazard since these compounds have a very low vapor pressure. However, where misting or elevated temperatures exist, air sampling to insure safe airborne exposure levels is advised.

4.3 Women of child-bearing age should not be assigned to tasks where periodic skin/eye exposure or a single extensive skin/eye exposure could occur with a reasonable likelihood. Considerable judgment is necessary in determining whether or not potentially harmful exposures to PCBs for women of child-bearing age can occur for a given task. Plant industrial hygiene and medical personnel in conjunction with the Pittsburgh Industrial Hygiene and Medical Divisions should be consulted when decisions are rendered as to whether or not women of child-bearing age should be assigned to particular tasks involving potential PCB exposures.

4.4 The above recommendation concerning women of child-bearing age refers to day-to-day assignments only and should not be used as a means of disqualifying any female from any classification or otherwise adversely affecting any other term or condition of employment such as promotion, shift assignments, and layoff selections. When the employee refuses such assignments it is a justification for an overtime by-pass.

4.5 Plant industrial hygiene personnel should always be consulted for guidance whenever situations arise involving potential employee exposures to PCBs. Industrial Hygiene Technical Bulletin #79-1, entitled "PCBs in Electrical, Hydraulic and Heat Exchanger Equipment," dated 1979 October 18 should be consulted by plant industrial hygiene personnel in determining appropriate industrial hygiene controls for PCBs.

5.0 GOVERNMENTAL INSPECTION OF ALCOA FACILITIES

The legislation provides for plant inspections by government representatives bearing the proper credentials. Plant Environmental or Industrial Hygiene representatives must be available for representing the plant interests for this visit. In addition to courteous treatment, two other major requirements must be handled effectively:

1. Complete notes shall be kept by our representative on the scope, recommendation, or mandates covered by the discussions.

2. The inspector may request that samples be taken of chemicals from our processes. One large sample must be taken and carefully divided into two portions, one for the inspector and another to be used by Alcoa for further tests. Complete documentation of the time, place, individuals involved, etc., must be recorded for each sample.

6.0 ELECTRICAL CAPACITORS, TRANSFORMER DIELECTRICS, AND OIL FILLED CIRCUIT BREAKERS

6.1 Until 1978, the dielectric fluids in capacitors were usually PCBs. The regulations state that capacitors with more than three pounds of dielectric fluid require special disposal procedures unless the label indicates no PCBs in the fluid. Large capacitors without proper labels can be disposed of in routine fashion after laboratory tests certify that no PCBs are present in the fluid.

6.2 A small number of electrical transformers used PCBs as the dielectric fluid. A large number of oil filled transformers were contaminated by PCBs accidentally or through careless handling at the time of manufacture. Some PCB contaminated oil has been found in circuit breakers.

6.3 With this variety of equipment applications and fluids, a precise method of testing for PCBs was initiated by the Analytical Chemistry Division at ATC. Equipment has been procured, analytical methods developed, and sampling procedures suggested in a memorandum that was sent to domestic and foreign locations (see reference 9). Within Alcoa, fluids in transformers and oil filled circuit breakers were tested for PCB content and recorded. Any unit in doubt should be tested and added to these records. A large amount of correspondence on these subjects has been shared between the plant staffs, Messrs. C. L. Pittman and H. E. Church of the Pittsburgh Engineering and Power Divisions respectively. (Mr. T. B. Oliver is now handling Mr. Pittman's correspondence on this subject.)

7.0 HYDRAULIC SYSTEMS

7.1 Monsanto is the only company that has used PCBs to formulate a phosphate ester hydraulic fluid called Pydraul-F9, A200, 625, etc. They discontinued the use of PCBs in those products in 1970, but residual amounts may remain in those systems which previously used those products. All fire resistant hydraulic fluids being marketed today are manufactured without PCBs. Alcoa has assumed that PCBs may still be present in any hydraulic system that used a phosphate ester (fire resistant) fluid prior to 1978.

7.2 In 1979, samples from all known phosphate ester hydraulic systems, past or present, were tested at ATC or by an EPA approved laboratory for PCB content. A system with concentration above 50 ppm was cleaned and refilled with PCB-free fluid. Records of these tests are available at each plant identifying the system, the concentration levels, and which contaminated fluids have been segregated pending ultimate treatment, recovery, or disposal.

7.3 Two PCB regulations were issued in 1979 (see references 2 and 3) and were not clear in routine checking requirements for the number of hydraulic systems in an industrial complex. In working with the EPA Alcoa submitted written comments (reference #4) on 1979-12-27 and oral comments at a public hearing in Washington, D. C. on 1980-01-20. Pending a further ruling by EPA, Alcoa is testing for PCBs on systems as described in 7.2 above. Additional testing should be done on systems which we suspect may have been accidentally contaminated during routine operation or maintenance functions.

closing Alcoa's approach, and is not intended to be a recommendation for any recipient other than Alcoa. No warranties, guarantees or representations, express or implied are made as to the utility or effectiveness of the methods, processes, products or procedures described or recommended herein.

7.4 The potential for PCB contamination of process lubricant formulations exists where hydraulic systems containing PCBs may have leaked into such lubricant formulations (i.e. hot mills, continuous rod mills, etc.). Even though these hydraulic systems may currently contain less than 50 ppm, past leakage may have already created a concern. Where a hydraulic leakage problem into a process lubricant formulation could have developed, the process lubricants must be checked for PCB concentrations to insure safe levels.

8.0 RECLAIMING PHOSPHATE ESTER HYDRAULIC FLUIDS

8.1 Where phosphate ester hydraulic fluids are removed from a system for filtration or reuse the PCB content must be determined. Fluids containing less than 50 ppm of PCB may legally remain in use. It is imperative that the PCB problem not be extended by adding a reclaimed contaminated fluid containing less than 50 ppm into a system that has no detectable level of PCBs.

8.2 Any quantities of PCB hydraulic fluids being held in restrictive storage should not be disposed of prematurely. EPA has published a disposal deadline of 1984 January 1 for all fluids taken out of service by 1983 January 1. While these rules are being litigated, ATC is trying to develop our own process for removing PCBs from these fluids. Final decisions on disposition will be based on our internal capabilities in combination with the EPA timetables.

9.0 HOT OIL HEAT TRANSFER SYSTEMS

9.1 High temperature heat transfer or heating systems are not commonly used in Alcoa's plants. If one does exist, it must be tested for the presence of PCBs.

9.2 When a petroleum oil was used as the heat transfer media no PCBs should have been present. Exxon's Caloria and Mobil's Mobilthurm, both identified as Alcoa ML 844, were commonly used for this application. Neither of these brands of fluid contained PCBs as part of their formulation but they should be checked to verify that fact.

9.3 Any system that used Monsanto Chemical's Therminol #1, #2, or #3 consisted of 100% PCB and should be handled accordingly. Monsanto's Aroclor 1242 or 1428 were likewise pure PCB fluids.

9.4 Any system that used Dow Corning's Dowtherm G, Alcoa ML 846, may contain monochlorinated biphenyls. In addition to chemical verification of this HCB content, and handling as a PCB fluid, the Dow Chemical Co. should be consulted for further information on these systems.

9.5 Any system using Monsanto's Therminol 55 or Therminol 66 should be PCB free (see Alcoa ML 847 and ML 848, unless one of the fluids mentioned in 7.1 and 9.3) had been used previously.

10.0 TESTING FOR PRESENCE OF PCBs

10.1 Testing for PCB content in any fluids should be conducted at the Analytical Chemistry Division, ATC. They have developed standard analytical methods (see reference 8) for use with suspect transformer oils, hydraulic fluids, and other oil matrices. Their testing program has been extended to waters, soils, sediments, and sludges as an outgrowth of their acceptance by Alcoa plants. Sampling procedures have been prepared (see reference 9) and contact should be made with J. P. Auses at ATC if further assistance is required. Some commercial laboratories, licensed by the EPA, are capable of conducting these tests as an alternate source.

REFERENCES

1 Technical Bulletin #79-1 titled "PCBs in Electrical Hydraulic and Heat Exchanger Equipment" dated 79-10-16. Available from Alcoa plant(s) Industrial Hygiene coordinator or Pittsburgh Industrial Hygiene Dept.

2 PCB Manufacturing Processing, Distribution in Commerce; and Use Prohibitions. Federal Register 44/106, 79-05-31, P. 31514 - 31568.

3 PCB Manufacturing Processing; Distribution in Commerce; and Use Prohibitions. Testing of Hydraulic Systems.
Federal Reg. 44/231, 79-11-29, P. 68489 - 68491

4 Alcoa letter to Documents Control Officer, TS 793, OPTS-62005, (PCB/RR-5) EPA. Letter written by J. S. Boyt Alcoa Pgh. Office 79-12-27.

5 Locating, Handling and Disposing of PCBs. Letter by L. L. Corbin, Pgh. to all plant engineering managers, dated 79-10-26.

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REFERENCES (Cont.)

6 EPA Regulations Pertaining to PCBs in Transformers, Capacitors, Hydraulic and Heat Transfer Systems and in Waste Oil - Letter from J. T. Bunting/C. L. Pittman, Pgh. to all plant engineering managers, date 79-08-23.

7 PCB Contamination of Phosphate Ester Hydraulic Fluids, letter by J. T. Bunting Pgh. to all plant engineering managers, 79-08-20.

8 Gas Chromatographic Analysis - Determination of PCBs in Insulating Fluids, Standard Analytical Method #3042, J. P. Auses Analytical Chem. Div. - ATC.

9 PCB Analysis - Analytical Chemistry Division ATC. J. P. Auses to Memorandum 1981/05/04.

10.2 For further and up-to-date information on PCBs, please contact your Environmental Department or your Industrial Hygiene contact. In Pittsburgh, contact any of the following persons:

M. E. Kommer - Environmental Control Department
T. B. Oliver - Electrical Engineering Division
H. E. Church - Power Engineering Division
R. M. James - Industrial Hygiene
G. R. Crook - Mechanical Engineering Division

Industrial Hygiene Technical Bulletin

No. 84-4

W. Thomas Washam, M.D.
Rockdale Works

Date: 1984 June 18

RE: NUISANCE DUST LIMITS

In the past, it has been our policy to use the Occupational Safety & Health Administration (OSHA) nuisance dust limits of 15 and 5 mg/M^3 for total and respirable dust, respectively. We have recently reviewed our position as relates to these limits and have decided that we will now adopt the American Conference of Governmental Industrial Hygienists (ACGIH) limits of 10 and 5 mg/M^3, respectively, for total and respirable fractions. The reasons for adopting these more stringent limits include the following:

A. Increasing emphasis on respiratory disease and its possible connection with the excessive inhalation of nuisance particulates. In conjunction with the above, recent findings within one of our operations suggest that excessive dust levels are associated with decrements in one pulmonary function parameter; and

B. The desire to achieve uniformity throughout Alcoa operations and with our customers as relates to exposure limits for nuisance dust. Mine Safety and Health Administration (MSHA) limits are 10 and 5 mg/M^3, respectively, for total and respirable dusts. Several of our facilities are covered by MSHA regulations. Moreover, the ACGIH dust limits of 10 and 5 mg/M^3 are widely used by various segments of industry and in many countries throughout the world.

These new limits for nuisance dust are effective immediately. Where appropriate, we are in the process of implementing these new limits on all of our commercial MSDS sheets as well as internally used materials.

If anyone has any questions concerning the above, please do not hesitate to contact us.

ROBERT M. JAMES

RMJ:nld

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I. H. Plant Contacts - Domestic & International
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