U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

HEALTH HAZARD EVALUATION DETERMINATION REPORT 73-43-103
COKE PLANT EAST WORKS
WHEELING-PITTSBURGH STEEL CORPORATION
FOLLENSBEE, WEST VIRGINIA

DECEMBER 1973

I. TOXICITY DETERMINATION

Based on the results of an environmental evaluation conducted by the National Institute for Occupational Safety and Health (NIOSH) on September 6, 1973, it has been determined that employee exposures to the concentrations of coal tar pitch volatiles (benzene soluble fraction) found at the Coke Plant East Works, Wheeling-Pittsburgh Steel Corporation, Follensbee, West Virginia are potentially toxic.

II. DISTRIBUTION AND AVAILABILITY

Copies of this hazard evaluation determination are available upon request from the Hazard Evaluation Services Branch, NIOSH, U.S. Post Office Building, Room 508, 5th and Walnut Streets, Cincinnati, Ohio 45202. Copies have been sent to:

(a) Wheeling-Pittsburgh Steel Corporation
(b) Authorized Representative of Employees
(c) U.S. Department of Labor - Region V
(d) NIOSH - Region VIII

For the purpose of informing approximately 250 exposed employees, this report shall be posted in a prominent place readily accessible to workers for a period of at least 30 days.

III. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health received such a request from the union representative, Local #1190, U.S.W.A., Steubenville, Ohio, to evaluate the potential hazards associated with the alleged exposures to coal tar pitch volatiles (benzene soluble fraction) at the Coke Plant East Works of Wheeling-Pittsburgh Steel Corporation, Follensbee, West Virginia.

IV. HEALTH HAZARD EVA

A. Plant Process

This plant produces coke to be used in the manufacture of steel. Coal is fed into the coke ovens from a larry car, where the coal is heated to high temperatures, producing coal tar pitch emissions which seep through the top of the coke ovens. This is the location of highest employee exposure.

Wheeling-Pittsburgh Steel Corporation is actively using administrative controls to limit coke oven worker exposure to the coke oven emissions. The lidman only works approximately four hours a day. The larry car operator gets two 45-minute rest periods a day. The pusher operator, the hot car operator, and the door machine operator all have two 45-minute rest periods per 8-hour shift. All coke plant workers have periodic chest X-rays and liver function tests to indicate any biological damage caused by coke oven emissions.

B. Evaluation Design

The coke oven plant employs approximately 250 workers. A total of ten coal tar pitch volatile samples were taken. All samples showed concentrations that exceeded the established Federal standard based on an 8-hour exposure. Results may be reviewed in the Appendix.

C. Methods

All dust and metal samples were collected on pre-weighed filters. All coal tar pitch volatiles (benzene soluble fraction) were analyzed in the NIOSH Cincinnati laboratory.

D. Evaluation Criteria

The occupational health standard relevant to the substance of this evaluation as promulgated by the U.S. Department of Labor (Federal Register, October 18, 1972) is as follows:

Subs	mg/M^3
Coal tar pitch volatiles (benzene soluble fraction)	0.2

mg/M^3 - milligrams of contaminant per cubic meter of air

Occupational health standards are established at levels designed to protect individuals occupationally exposed to individual toxic substances on an 8-hour per day, 40-hour per week basis over a normal working lifetime.

E. Evaluation Results and Discussion

On September 6, 1973, a total of ten personal samples were taken in different areas of the coke plant. Laboratory analysis of these samples showed that the highest exposures occurred to the larry car operators and lidmen. Analysis of samples collected on these men showed concentrations of 6.1, 6.4, 5.7, 4.3, 3.7, and 2.2 mg/M^3 for coal tar pitch volatiles (benzene soluble fraction). Lower exposures occurred among pusher operators and oven door repairmen. Their exposures ranged from 0.6 to a high of 0.8 mg/M^3.

Since the plant is using administrative controls to reduce employee exposures to coal tar pitch volatiles, employee exposures were calculated on the basis of actual working time. These adjusted exposure values are shown in Appendix 1 together with the raw exposure data discussed above. It is readily apparent that the exposures of many workmen far exceed the occupational health standard even though administrative control is being exercised.

F. Recommendations

1. Monitoring of emissions from the coke ovens should be a routine activity of the industrial hygiene staff of the Wheeling-Pittsburgh Steel Corporation.

2. Administrative controls limiting employee exposure to coke oven emissions should be followed very closely, since employee exposure is very high in this area.

3. The respirator program should be strongly enforced.

4. Oven door repairmen and lidmen should perform their duties so as to permit proper sealing of the oven lids and oven doors. This would prevent large quantities of coke oven emissions from escaping into the breathing zones of the workers.

5. The medical program now in operation at the plant, which includes X-ray and liver function for coke oven workers, should be continued.

Note: For further information regarding appropriate work practices for coke oven operations consult NIOSH's "Criteria for a Recommended Standard .....Occupational Exposure to Coke Oven Emissions", Office of Research and Standards Development, National Institute for Occupational Safety and Health.

'ENDIX 1

COAL TAR PITCH VOLATILES
Benzene Soluble Fraction

Job Classification	Sampling Time (minutes)	Benzene Soluble Fraction (mg/M^3)	Average Exposure Based on Actual Working Time* (mg/M^3)
Larryman[1]	161	6.1	3.5
Larryman	160	5.7	3.5
Lidman[2]	157	4.3	2.2
Oven door repairman[3]	150	0.6	0.6
Lidman	159	3.7	1.8
Larryman	143	1.6	1.0
Lidman	130	0.8	0.4
Lidman	128	6.4	3.2
Lidman	126	2.2	1.1
Pusher operator[4]	138	0.6	0.6

rk schedule of the above workers given below:

arryman = 5 hours of work each day

idman = 4 hours of work each day

ven door repairman = 8 hours of work each day

usher operator = 5 hours of work each day

* The Industrial Hygienist may use several means of calculating exposures. Obviously, any method used will still show values that are potentially toxic.

V. AUTHORSHIP AND ACKNOWLEDGMENTS

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