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HEALTH HAZARD EVALUATION REPORT 72-37-18
HAZARD EVALUATION SERVICES BRANCH
DIVISION OF TECHNICAL SERVICES

Establishment: Empire Detroit Steel Company
New Boston, Ohio

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

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EMPIRE DETROIT STEEL COMPANY
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SUMMARY DETERMINATION

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 a health hazard evaluation request from an authorized representative of employees regarding exposure to heat, noise, coal tar pitch volatiles, carbon monoxide, graphite, and coal dust in the coke oven unit, the coke plant department, and the blast furnace department of the Empire Detroit Steel Company in New Boston, Ohio. Various operations such as the blast furnace were on strike at the time that this hazard evaluation was conducted. This report pertains only to coal tar pitch volatiles and noise measurements. Following this investigation, an Occupational Safety and Health Administration industrial hygienist of the U.S. Department of Labor conducted a survey of this same establishment. Additional investigation by a NIOSH industrial hygienist is pending on the results of the OSHA survey and the actions taken by OSHA on violations found. There is no need for OSHA and NIOSH to investigate the same occupational hazards, since any violation of a standard found by NIOSH would be referred to OSHA for further investigation and compliance action.

The coal tar pitch volatiles were measured as mg of benzene-soluble/ M^3 . The coal tar pitch volatile samples were taken on top of the coke ovens in the coke plant department on June 27-29, 1972. Sample analyses were conducted in the NIOSH Cincinnati laboratory. Most of the samples were well above the Department of Labor standard of 0.2 mg/ M^3 , ranging from 0.05 to 8.82 mg/ M^3 . Some areas of the coal operations had noise levels in excess of the standard. Recommendations have been made to management to obviate the observed hazard to affected employees.

Copies of this Summary Determination as well as the Full Report of the evaluation are available from the Hazard Evaluation Services Branch, NIOSH, Cincinnati, Ohio 45202. Copies of both have been sent to:

- a) Empire Detroit Steel Company
- b) Authorized Representative of Employees
- c) U.S. Department of Labor - Region V

For purposes of informing "affected employees," the employer will either (1) "post" the Summary Determination in a prominent place near where affected employees work or (2) provide a copy of the determination to each affected employee.

I. 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.

This health hazard evaluation request was received from an authorized representative of employees and concerns employee exposure to numerous physical and chemical agents found throughout the coke oven unit, the coke plant department, and the blast furnace. The blast furnace area is not reported on, since it was on strike at the time of this evaluation.

II. BACKGROUND HAZARD INFORMATION

Coal tar pitch volatiles contained a large quantity of lower molecular weight polycyclic hydrocarbons. As these hydrocarbons (naphthalene, fluorene, anthracene, acridine, phenanthrene) sublime into the air, there is an increase of benzo (a) pyrene (BaP or 3,4-benzpyrene) and other higher weight polycyclic hydrocarbons in the tar and in the fumes. Polycyclic hydrocarbons known to be carcinogenic are of this large molecular type.¹

Numerous publications and investigations have pointed out that people working in the steel industry in areas of the coal tar pitch volatiles have a much higher incidence of lung cancer. Since no safe limit of exposure can be established for carcinogens, and because of the instability in the composition of coal tar pitch volatiles, a limit of 0.2 mg of benzene-soluble/M should minimize exposure to these carcinogens.

III. HEALTH HAZARD EVALUATION

A. Initial Visit - Observational Survey

An initial hazard evaluation survey of the Empire Detroit Steel Company was made on June 1, 1972, by NIOSH Industrial Hygienist Bobby J. Gunter, Ph.D. The function of NIOSH and its relation to Section 20(a)(6) of the Occupational Safety and Health Act of 1970 and the purpose of the visit were explained to Mr. _____, Director of Environmental Control; Mr. _____, Manager, Industrial Relations and Safety; Mr. _____, Director of Safety;

¹ American Conference of Governmental Industrial Hygienists, Documentation of the Threshold Limit Values for Substances in Workroom Air, Third Edition, 1971, Post Office Box 1937, Cincinnati, Ohio 45201.

Mr. _____ and Mr. _____, OSHA Compliance Committee Chairmen; and Mr. _____, General Superintendent, all employees of Empire Detroit Steel Company. The National Surveillance Network Part I questionnaire was completed with the assistance of the above gentlemen.

The Empire Detroit Steel Company was on partial strike at the time of this survey. The coke oven units and the coke plant department were only operating under two shifts: 11 p.m. to 7 a.m. and 11 a.m. to 7 p.m. The blast furnace operations were not in operation due to the strike.

When the plant is under full production, there are 125 workers in the coke oven units and coke plant department. There are also 125 workers in the blast furnace department when it is in full operation.

The potential health hazards associated with the coke oven department and the blast furnace department are outlined in the following paragraphs.

1. Coke Oven Unit - Coke Plant Department

There are approximately 10 men per shift exposed to the coal tar pitch volatiles emitted from the coke ovens. There are an additional 9 men per shift exposed to coal dust. These men are also exposed to excessive noise levels created by the dumping of coal from the railroad cars on to the hopper. There are numerous other areas in this location; however, none were directly connected to the coke oven units or the coke plant department. There is a total of about 60 workers directly connected with the health hazards associated with the coke oven units.

2. Blast Furnace Area

This area, as previously described, was not in operation due to an employee strike. However, Dr. Gunter did perform a walk-through survey and took notes from management and union personnel concerning areas that should be checked for specific health hazards. There are approximately 86 men working in this area. They are possibly exposed to: a) noise, b) carbon monoxide, and c) heat. A proper evaluation of this area can only be obtained when it is in operation. A follow-up environmental survey should be conducted as soon as possible.

As a result of this initial visit, it was determined that environmental measurements for coal tar pitch volatiles, noise, carbon monoxide, and coal dust be taken at the Empire Detroit Steel Company in New Boston, Ohio.

B. Environmental Survey

On June 27 through 29, 1972, a follow-up health hazard survey was conducted by Dr. Bobby J. Gunter and Mr. Raymond L. Ruhe to determine environmental exposures to coal tar pitch volatiles, noise, carbon monoxide, and coal dust. The coal dust samples were excluded from this report, since they were improperly collected. Coal tar pitch volatiles were collected on top of the coke ovens. Carbon monoxide measurements were taken throughout the coke operation; and noise measurements were taken throughout the coal and coke operations.

Nineteen personnel samples were collected. The average sampling time was six hours. Employee name and occupation were recorded to identify the sample collected and location. The personnel sampler worn by employees to obtain breathing zone samples consisted of an MSA portable pump, Model G, operated at 2 liters per minute, pulling air through a 37 mm filter contained in a millipore field monitor cassette. Personnel monitor samples for coal tar pitch volatiles were collected on 37 mm silver membrane filters having a pore size of 0.8 microns.

Results:

The air samples were analyzed by the Division of Laboratories and Criteria Development, NIOSH, Cincinnati, Ohio. Results of the analysis in mg of benzene-soluble/M³ are shown in the enclosed Table I.

In Table I it may be noted that the concentration of the coal tar pitch volatiles measured as mg of benzene-soluble/M exceeded the standard of 0.2 mg/M³.

Noise:

Some areas of the coal operations had high noise levels.

Exposure to excessive noise levels can produce permanent hearing loss in man.

It has been determined that substances as presently defined in Section 20(a)(6) of the Act do not include physical agents such as noise. However, for completeness of this survey, I am reporting this in my evaluation, since it was a definite occupational health hazard. The Williams pulverizer at the mixer level registered 103 dBA; at the #1 scraper level in the coal operation, 107 dBA; and at the west shaker on the coal handler, 113 dBA. Other areas of the plant had levels of 91 dBA and lower. These measurements were taken in locations representing the workers hearing zone with a General Radio sound level meter calibrated prior to use.

Carbon Monoxide:

Carbon monoxide measurements were taken throughout the coke and coal departments, using an MSA portable carbon monoxide analyzer. No carbon monoxide was detectible. This instrument was calibrated prior to use and is capable of detecting concentrations well below the recommended standard for carbon monoxide.

IV. RECOMMENDATIONS

Coke Ovens:

1. The use of Bureau of Mines approved respirators for pneumoconiosis-producing dust is recommended for all personnel working in the coke and coal tar pitch areas. Their use should be instituted immediately and continued until such time as it can be shown that exposure levels are well below the standard.

2. Workers should be rotated on top of the coke ovens so as to prevent heat exhaustion. Protective clothing should also be provided to all workers in this area.

Noise:

1. Feasible engineering controls for reducing noise levels should be implemented.

2. Personal protective equipment should be provided immediately and worn by all employees whose exposure exceeds the standard until such time as controls are effected.

TABLE I

COAL TAR PITCH VOLATILE SAMPLES COLLECTED
ON TOP OF COKE OVENS

<u>Date</u>	<u>Sample Number</u>	<u>Job Classification</u>	<u>Mg Benzene-Soluble/M³</u>
6/27/72	25	Door Cleaner	1.64
"	21	Larry Man	0.60
"	18	Oven Spellman	Not Detectible
"	13	Oven Spellman	1.69
"	14	Lidman	2.11
"	17	Door Cleaner	0.05
"	19	Heater Helper	4.39
"	23	Door Machine	1.39
"	20	Pusher Operator	0.18
6/28/72	8	Larry Man	8.82
"	9	Lidman	3.03
"	7	Door Cleaner	0.43
"	24	Door Cleaner	0.80
"	11	Pusher Operator	2.13
"	15	Oven Spellman	1.53
"	6	Oven Spellman	0.76
"	10	Heater Helper	4.29
"	22	Larry Car West Cab	8.04
"	4	Top C.S. #690	1.48

Standard 0.2 mg of Benzene-Soluble/M³