FILE COPY

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

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 73-179-123

EMPIRE-DETROIT STEEL DIVISION
NEW BOSTON, OHIO

MARCH 1974

I. TOXICITY DETERMINATION

At the time of this evaluation (January 7, 1974), it was determined that the airborne concentration of carbon monoxide (CO) is not toxic in the blast furnace area. This determination is based upon results from environmental samples collected in this department, upon observation of the work area, employee interviews, and known toxicity of CO.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report 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) Empire-Detroit Steel Division

b) Authorized Representative of Employees

c) U.S. Department of Labor - Region V

d) NIOSH - Regions V

For the purposes of informing approximately fifty "affected employees," the employer will promptly "post" the Determination Report in a prominent place(s) near where affected employees work for a period of 30 calendar 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 (NIOSH) received such a request from the union representative, United Steel Workers of America, New Boston, Ohio, to evaluate the potential hazard associated with the alleged exposure to carbon monoxide in the work place.

IV. HEALTH HAZARD EVALUATION

A. Plant Process - Conditions of Use

The blast furnace area of a steel mill is the area where raw iron ore, coke, and limestone are mixed together under hot temperatures to produce steel. The blast furnace area covers approximately 60,000 square feet. Carbon monoxide exposures are likely to occur from the incomplete combustion of raw materials as they are heated.

B. Evaluation Design and Methods

An observational and environmental investigation was conducted on January 7, 1974. Continuous monitoring of CO was performed in areas of the plant where highest concentrations were likely to occur. These areas were identified by use of Draeger detector tubes and pumps. The employee representative also agreed that these were the areas that should be investigated.

Medical questionnaires were given to seven workers. None of these workers complained of any health problems other than loss of hearing due to the excessive noise in this area.

C. 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:

Substance	ppm
Carbon monoxide	50

ppm - parts of vapor or gas per million parts of contaminated air by volume

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. NIOSH has forwarded to the Department of Labor a recommended criteria for exposure to CO of 35 ppm for an 8-hour day, 40-hour week.

D. Evaluation Results and Discussion

Carbon monoxide levels at the time of this evaluation were very low. Carbon monoxide samples were taken in all areas of the blast furnace. Highest concentrations were found below the blast furnace area, where workers are stationed for only short periods of time. Concentrations in this area never exceeded 40 ppm. Concentrations of carbon monoxide in all other areas of the plant ranged from 0 ppm to 30 ppm.

The plant management has shown their interest in protecting the employees from CO exposures by installing continuous carbon monoxide monitors in the change room and in the foreman's headquarters. It is also of interest that the cigarette smoke in the foreman's headquarters did cause significant increases in CO levels.

E. Recommendations

1. If the situation arises where high concentrations of carbon monoxide occur, management should provide approved respirators for employees working in this area.

2. Monitoring of CO levels should be broadened to cover all areas of the blast furnace.

AUTHORSHIP AND ACKNOWLEDGMENTS

Report Prepared By: Bobby J. Gunter, Ph.D.
Regional Industrial Hygienist
NIOSH Region VIII - Denver, Colorado

Originating Office: Jerome P. Flesch, Chief
Hazard Evaluation Services Branch
Cincinnati, Ohio

Acknowledgment

Environmental Evaluation: Raymond L. Ruhe
Industrial Hygienist
Hazard Evaluation Services Branch
Cincinnati, Ohio