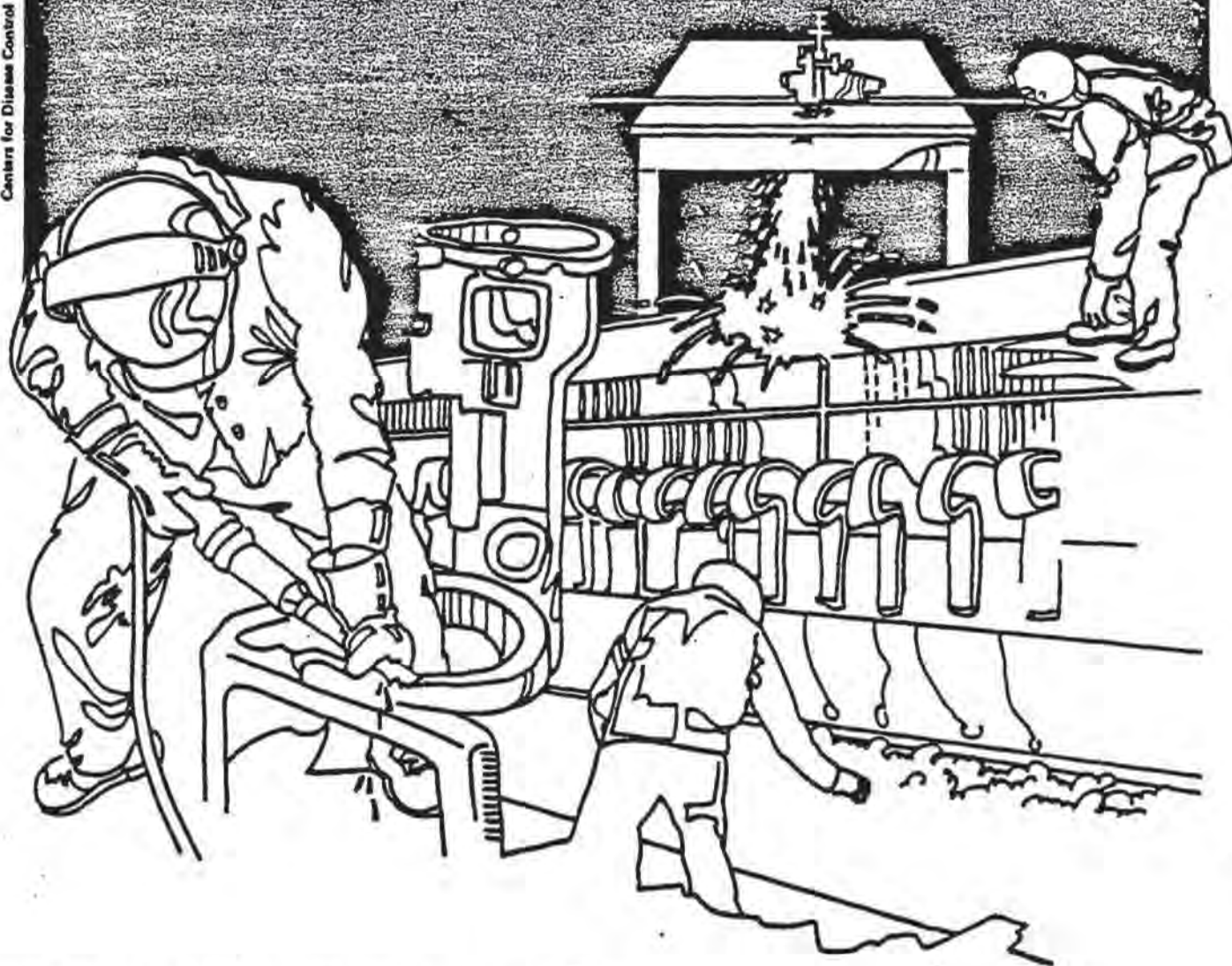


NIOSH



Health Hazard Evaluation Report

HETA 81-157-1516
INLAND STEEL COMPANY
EAST CHICAGO, INDIANA

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from 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 Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

HETA 81-157-1516
OCTOBER, 1984
INLAND STEEL COMPANY
EAST CHICAGO, INDIANA

NIOSH INVESTIGATOR:
Peter Orris, M.D., M.P.H.

I. SUMMARY

On January 26, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request to conduct a Health Hazard Evaluation at Inland Steel Company, East Chicago, Indiana. The requestor was concerned with leukemia deaths among boilermakers and riggers in the Field Forces Department.

In April 1981 NIOSH conducted an initial survey of the area. In September 1982 interviews were conducted with employees to elicit further information concerning possible carcinogenic exposures. No exposure history to benzene or other possible leukomogens could be elicited by individual worker interviews or company records.

During the next two years information was collected from the company, union, insurance carrier, and the Social Security Administration concerning the number and cause of deaths of employees working in this area between January 1950 and December 1970.

Of the 234 Field Force Department employees that worked for more than five years: 53 were known to have died and no information was available on 21. Information supplied by the insurance carrier and the Social Security Administration as to cause of death on 49 of the deceased employees revealed no leukemia deaths amongst former riggers.

Of the 162 boilermakers, 36 were known to have died and no information could be obtained on 4. Thirty five death certificates were obtained. Two former boilermakers had died of leukemia, one chronic lymphocytic and the other acute myolegenous in type. Based on the death rate due to leukemia in the 60 to 64 year old white male population of the United States in 1980, 0.57 deaths due to leukemia would be expected in this group. Two additional leukemia deaths amongst boilermakers would be necessary before a statistically significant difference in rates could be observed to an alpha error of 0.05.

As the cause of only one confirmed death remains unidentified and the vital status of four other individuals could not be located, it is extremely unlikely that two additional leukemia deaths would be found amongst this group. No information is therefore available that would indicate that employees in the Field Forces Department are at increased risk of dying of leukemia.

On the basis of the data obtained in this investigation, NIOSH did not identify an increased incidence of leukemia nor a known or suspected leukemogenic exposure to employees in the Field Forces Department of the Inland Steel Company, East Chicago, Indiana.

KEY WORDS: SIC 3312 (Steel Works and Rolling Mills), Cancer, Leukemia, Field Forces, riggers, boilermakers.

II. INTRODUCTION

On January 26, 1981, a confidential requestor submitted a Health Hazard Evaluation request to The National Institute For Occupational Safety and Health (NIOSH). The request concerned a possible increased mortality from leukemia amongst Field Force riggers and boilermakers at the Inland Steel Company Indiana Harbor Plant in East Chicago, Indiana.

On April 3, 1981 a NIOSH medical officer met with the requestor. Later that morning separate meetings were held with United Steel Workers of America, Local 1010 safety and health representatives and representatives of Inland Steel Company management.

The NIOSH investigator along with union and management safety representatives conducted a survey of the field force locker room area and selected sites of activity of these employees. On September 28, 1982 interviews were conducted with employees to elicit further information concerning possible carcinogenic exposures. During the next two years information was collected from the company, union, insurance carrier, and the Social Security Administration concerning the number and cause of deaths of employees working in this area between January 1950 and December 1970, and possible exposures to potentially carcinogenic substances.

III. BACKGROUND

A. Plant Production and Workforce

The Indiana Harbor plant of Inland Steel manufactures structural steel products. Raw materials are delivered to the plant in the form of coal, limestone, and iron ore and are processed into finished steel. The plant was first opened in the 1930's and at the time of this evaluation employed approximately 23,000 production workers. The field force workers are those working on repair and construction of steel throughout the plant. This force has existed since 1935 and at the time of the study employed 136 Boilermakers and 62 riggers. All of these workers use a single locker room.

B. Description of Employee Duties

Boilermakers repair and construct steel structures throughout the plant. They fabricate the steel by cutting, grinding, welding, riveting, fitting, and installing the pieces. Carbon steel is used 99% of the time but stainless steel is also occasionally used. Carbon arc stick welding is the primary welding method in use. Local ventilation for these processes both in the field forces shop and on location are rarely used. Respirators are not routinely worn.

Riggers assist in the lifting and placement of heavy machinery and structural steel. They maintain and repair their own hoists and cranes. No respiratory protection is worn and most activity is out of doors. Solvents and greases are used in maintenance and repair of the machinery.

IV. METHODS AND MATERIALS

An initial survey was performed to identify potential toxic exposures to the riggers and boilermakers with particular emphasis on possible carcinogens. In addition, information was collected concerning the number and cause of deaths of employees working in this area between November 1950 and December 1970. This cohort was selected to secure a group of workers for which there was information concerning mortality status and having a substantial period since first exposure to allow for a carcinogenic latent period. The information was obtained from company, union, insurance carrier, and Social Security Administration records. Subsequently, the mortality data available was subjected to biostatistical evaluation to determine whether an increased incidence of deaths due to leukemia existed amongst former field force workers.

V. EVALUATION CRITERIA

Mortality Evaluation

Based on NIOSH experience a method was designed to most conservatively estimate the expected leukemia deaths for this group employees in the Field Forces Department. The rate of leukemia in the 60 to 64 year old white male population of the United States in 1980 was 19.1 per 100,000.¹ A modified SMR approach was utilized to estimate an expected number of deaths due to leukemia for this group. This estimation was based on information from NIOSH mortality studies with groups of similar age, sex, and race.¹

VI. RESULTS

Environmental

These Field Force workers were not routinely exposed to any other known or suspected carcinogen that could be identified during the initial survey, subsequent interviews with longtime employees, nor subsequent investigation of the materials used in the process.

Medical

Of 234 men who worked for more than five years in the Field Force Department between January 1950 and December 1970: 53 worked from 5 - 9 years, 85 worked from 10 - 14 years, and 96 worked 15 - 19 years. Of these employees: 181 were first employed 20 - 30 years ago, and 53 were first employed 10 - 19 years ago.

Information as to cause of death was available from company, union, and insurance carrier records only on those employees who died on the job or retired and were eligible for death benefits. Of the 234 employees under study, no information was available on 21. Fifty-three had died of which the cause of death was available on 49. These records revealed no leukemia deaths amongst riggers.

Additional data was obtained on deceased former boilermakers from the Social Security Administration. Of the 162 boilermakers, 36 were known to have died and no information could be obtained on 4. Thirty-five death certificates were obtained. Two former boilermakers had died of Leukemia, one chronic lymphocytic and the other acute myolegenous in type. Records were not available on one confirmed deceased and four other former boilermakers.

VII. DISCUSSION

In order to calculate an expected number of cancer deaths for this group of boilermakers it was necessary to estimate the total person years of exposure of the 161 employees who had worked more than 5 years in this job category. This figure was developed on the basis of an average of 26 years since first exposure, subtracting the 5 years minimum exposure limit, per person with a 10% reduction to correct for deaths before the time of the study.³ This produced 2,962 person years.

Based on NIOSH experience, the rate of Leukemia deaths in United States white males who were between 60 and 64 year old in 1980, would be the best index to derive a rough estimate of the number of expected leukemia deaths for these Field Force workers. This rate, combined with the number of person years of exposure to the Field Forces Department, yielded 0.57 deaths expected due to leukemia amongst this group.

Two additional leukemia deaths would be necessary before a statistically significant difference in rates could be observed to an alpha error of 0.05.³ As the cause of only one confirmed death remains unidentified and the vital status of four other individuals could not be located, it is extremely unlikely that two additional leukemia deaths would be found.

Due to the absence of exposure to a known leukemogen, the small size of this group, and the inherent bias of a cluster triggered epidemiologic study, no conclusion can be drawn from these data. No information is therefore available that would indicate that employees in the Field Forces Department are at increased risk of dying of leukemia.

In addition, Redmond's review of comparative cause-specific mortality in the steel industry demonstrated the cause-specific frequency of deaths in workers employed in different areas of steel production and compared them with the rates for a total cohort of 58,828 steel workers. This study, published in 1975, did not demonstrate an increase in overall mortality nor was any specific cause of death increased in maintenance or repair workers.⁴

VIII. RECOMMENDATIONS

1. No further surveillance for leukemia in this department would appear to be necessary based on these data.

IX. REFERENCES

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XI. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days the report will be available through the National Technical Information Services (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from NIOSH publications office at the Cincinnati, address. Copies of this report have been sent to the following:

- A. United Steel Workers Union, Local No. 1010
- B. United Steel Workers Union, Dist. 31
- C. Inland Steel Company
- D. U.S. Department of Labor, OSHA - Region V
- E. NIOSH Regional Offices/Divisions

For the purposes of informing the affected employees, copies of the report should be posted in a prominent place accessible to the employees, for a period of 30 calendar days

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