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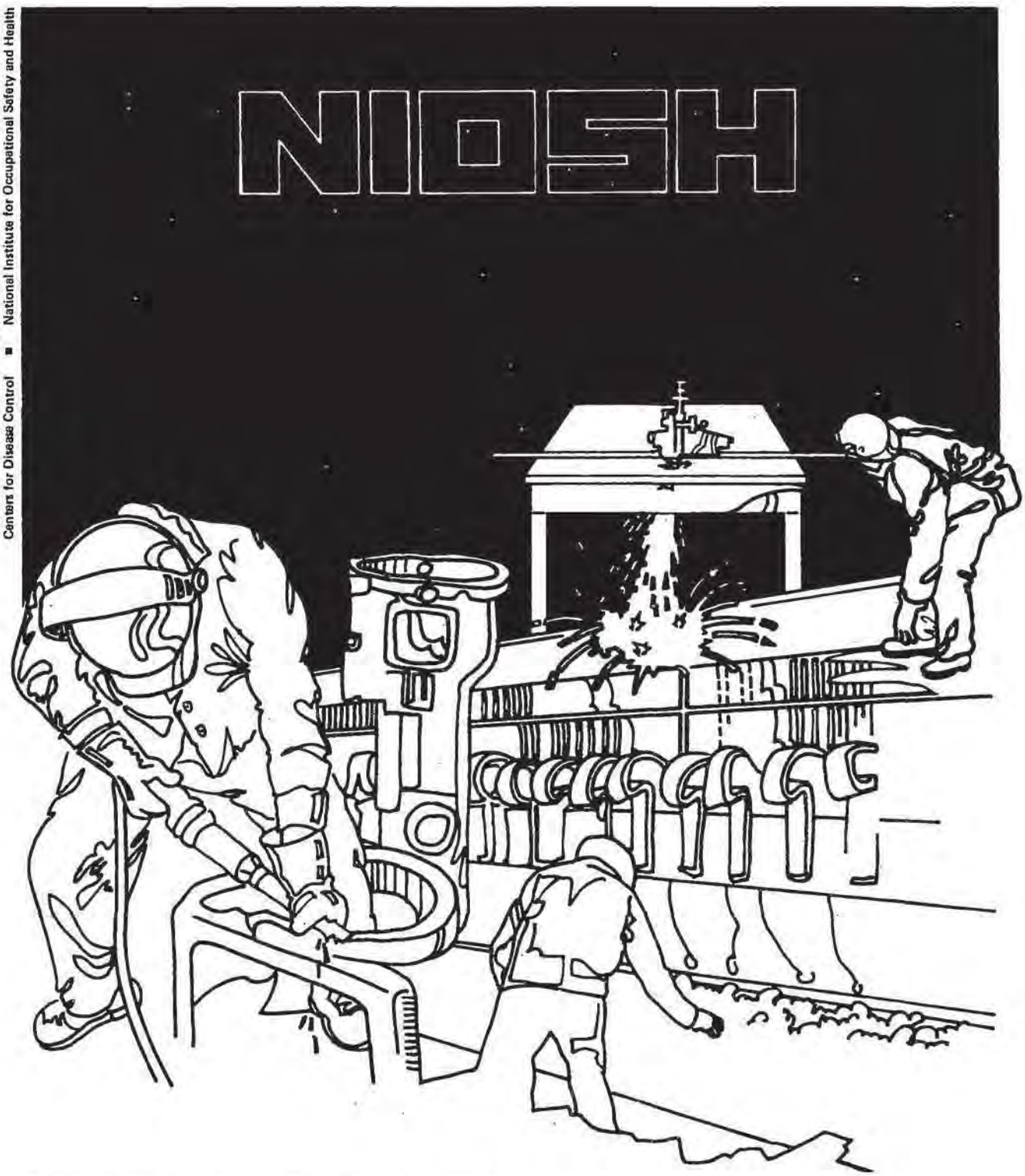

Health Hazard Evaluation Report

HETA 82-029-1112
E.M.J.D. CORPORATION
ENGLEWOOD, COLORADO

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 82-029-1112
MAY 1982
E.M.J.D. CORPORATION
ENGLEWOOD, COLORADO

NIOSH INVESTIGATOR:
Raymond L. Ruhe, I.H.

I. SUMMARY

On November 2, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request to conduct a health hazard evaluation at the E.M.J.D. Corporation, Englewood, Colorado. The request concerned exposures to airborne particulate and metal dusts in the electronic sheet metal fabrication area. This area has nine employees and one foreman.

On February 9, 1982, NIOSH conducted an industrial hygiene survey to determine airborne dust concentrations. Medical questionnaires were completed on 10 employees, to evaluate their symptoms to determine past and present occurrences of health problems associated with dust exposure.

The 8-hour time-weighted average (TWA) exposure to total airborne particulates ranged from 0.15 to 2.27 milligrams per cubic meter of air (mg/m^3). The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) for total particulates is 10 mg/m^3. Iron particulate concentrations ranged from 0.01 to 0.09 mg/m^3 8-hour TWA. The ACGIH TLV for iron particulate (nuisance dust) is 10 mg/m^3. Aluminum particulate concentrations ranged from less than detectable limits (0.010 mg/sample) to 0.29 mg/m^3. The ACGIH TLV is 10 mg/m^3. All manganese sample results were less than detectable limits (0.001 mg/sample).

Interviews with 10 workers performing duties in the sheet metal fabrication area failed to identify definite work-related health problems in that area.

Based on the environmental sample results, employee interviews, and available toxicological information, NIOSH concludes that a health hazard did not exist at the time of the survey on February 9, 1982.

KEYWORDS: SIC 3444 (Sheet Metal Work), total particulate, iron, manganese, and aluminum.

II. INTRODUCTION

On November 2, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request from the plant manager for a health hazard evaluation at the E.M.J.D. Corporation, Englewood, Colorado, to evaluate employees exposures to total particulate and metal dusts in the electronic sheet metal fabrication area. This area has nine employees and a foreman. On February 9, 1982, NIOSH conducted an industrial hygiene survey to determine airborne concentrations of total particulate, iron, manganese, and aluminum.

Preliminary findings of this evaluation were reported in a letter on April 19, 1982, to the management.

III. BACKGROUND

The E.M.J.D. Corporation fabricates electronic precision sheet metal boxes for various industries. The company employs 23 persons (19 production workers) and occupies a one-story building with approximately 16,000 square feet.

The sheet metal fabrication area has nine employees and one foreman. The sheet metal enters the plant and goes through a number of operations, such as punch press, shearing, brake, sanding, spot welding, and hardware, depending on the specification. The finished product is then inspected and shipped to the customer.

IV. EVALUATION METHODS

Breathing zone air samples were collected on sanders, punch press operators, shearing operator, brake operator, hardware operator, welder, and foreman for evaluation of exposure to total particulates and to particulates of iron, manganese, and aluminum. The airborne particulates were collected on preweighed Millipore M-5 polyvinyl chloride filters using MSA Model G personal sampling pump operating at 1.5 liters per minute (LPM). The total particulate was determined gravimetrically by weight gain on the filter, and the iron, manganese, and aluminum concentrations were determined using atomic absorption spectrophotometry according to NIOSH Method P&CAM 173.[1]

Medical questionnaires were completed on the ten employees who were being monitored in order to determine past and present occurrences of health problems associated with exposure to the dusts evaluated.

V. EVALUATION CRITERIA

Environmental

The environmental evaluation criteria used for this study are presented in Table I.

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

VI. RESULTS AND DISCUSSION

Table I presents the results of the ten personal breathing zone air sample results for total particulate, iron, manganese, and aluminum. The total particulate concentrations ranged from 0.15 to 2.27 milligrams per cubic meter of air (mg/m^3) 8-hour TWA. The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) for total particulates is 10 mg/m^3 8-hour TWA. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) is 15 mg/m^3 8-hour TWA.

Iron particulate concentrations ranged from 0.01 to 0.09 mg/m^3 8-hour TWA. The ACGIH TLV for iron particulate (nuisance dust) is 10 mg/m^3 8-hour TWA. Aluminum particulate concentrations ranged from less than detectable limits (0.010 mg/sample) to 0.29 mg/m^3. The ACGIH TLV is 10 mg/m^3 8-hour TWA. All manganese sample results were less than detectable limits (0.001 mg/sample). All exposures were well below the environmental criteria and the OSHA standards.

Interviews with ten workers performing duties in the sheet metal fabrication area failed to identify definite work-related health problems in that specific work area.

VII. CONCLUSION

Based on the environmental sample results, employee interviews, and available toxicological information, NIOSH concludes that a health hazard did not exist at the time of the survey.

VIII. REFERENCE

1. National Institute for Occupational Safety and Health. NIOSH manual of analytical methods. Vol 1, 2nd ed. Cincinnati, OH: National Institute for Occupational Safety and Health, 1977. (DHEW (NIOSH) publication no. 77-157-A).

IX. AUTHORSHIP AND ACKNOWLEDGEMENTS

Report Prepared by:	Raymond L. Ruhe Industrial Hygienist Industrial Hygiene Section
Originating Office:	Hazard Evaluations and Technical Assistance Branch Division of Surveillance, Hazard Evaluations, and Field Studies Cincinnati, Ohio
Report Typed By:	Debra A. McDonald Clerk-Typist Industrial Hygiene Section

X. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), 5285 Port Royal, Springfield, Virginia 22161. 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:

1. E.M.J.D. Corporation
2. NIOSH, Region VIII
3. OSHA, Region VIII

For the purpose of informing the 10 affected employees, copies of this report shall be posted by the employer in a prominent place accessible to the employees for a period of 30 calendar days.

TABLE I

Personal Breathing Zone Concentrations of Total Particulate, Iron, Manganese, and Aluminum

E.M.J.D. Corporation
Englewood, Colorado
HETA 82-029

February 9, 1982

Job and/or Location	Sampling Period	Sample Volume (Liters)	8-Hour TWA Air Concentration (mg/m^3)*			
			Total Particulate	Metal Particulates		
				Iron	Aluminum	Manganese
Sander Operator	0703-1501	717	0.40	0.04	0.08	LD**
Sander Operator	0705-1504	718	2.27	0.09	0.29	LD
Sander Operator	0708-1504	670	0.42	0.02	0.05	LD
Punch Press Operator	0720-1503	694	0.41	0.01	LD	LD
Punch Press Operator	0727-1503	625	0.19	0.01	LD	LD
Shearing Operator	0713-1503	651	0.15	0.01	LD	LD
Brake Operator	0723-1502	688	0.25	0.01	LD	LD
Hardware Operator	0716-1504	702	0.19	0.02	LD	LD
Welder	0710-1503	658	0.68	0.02	LD	LD
Foreman	0729-1500	676	0.20	0.01	LD	LD
Environmental criteria (mg/m^3)			10(A)	10(A)	10(A)	5(A)
Limit of detection (mg/sample)			0.01	0.002	0.010	0.001

* mg/m^3 = milligrams of substance per cubic meter of air sampled.
** LD = less than detectable limits.
(A) = ACGIH TLV: 8-hour TWA.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ROBERT A. TAFT LABORATORIES
4676 COLUMBIA PARKWAY, CINCINNATI, OHIO 45226

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