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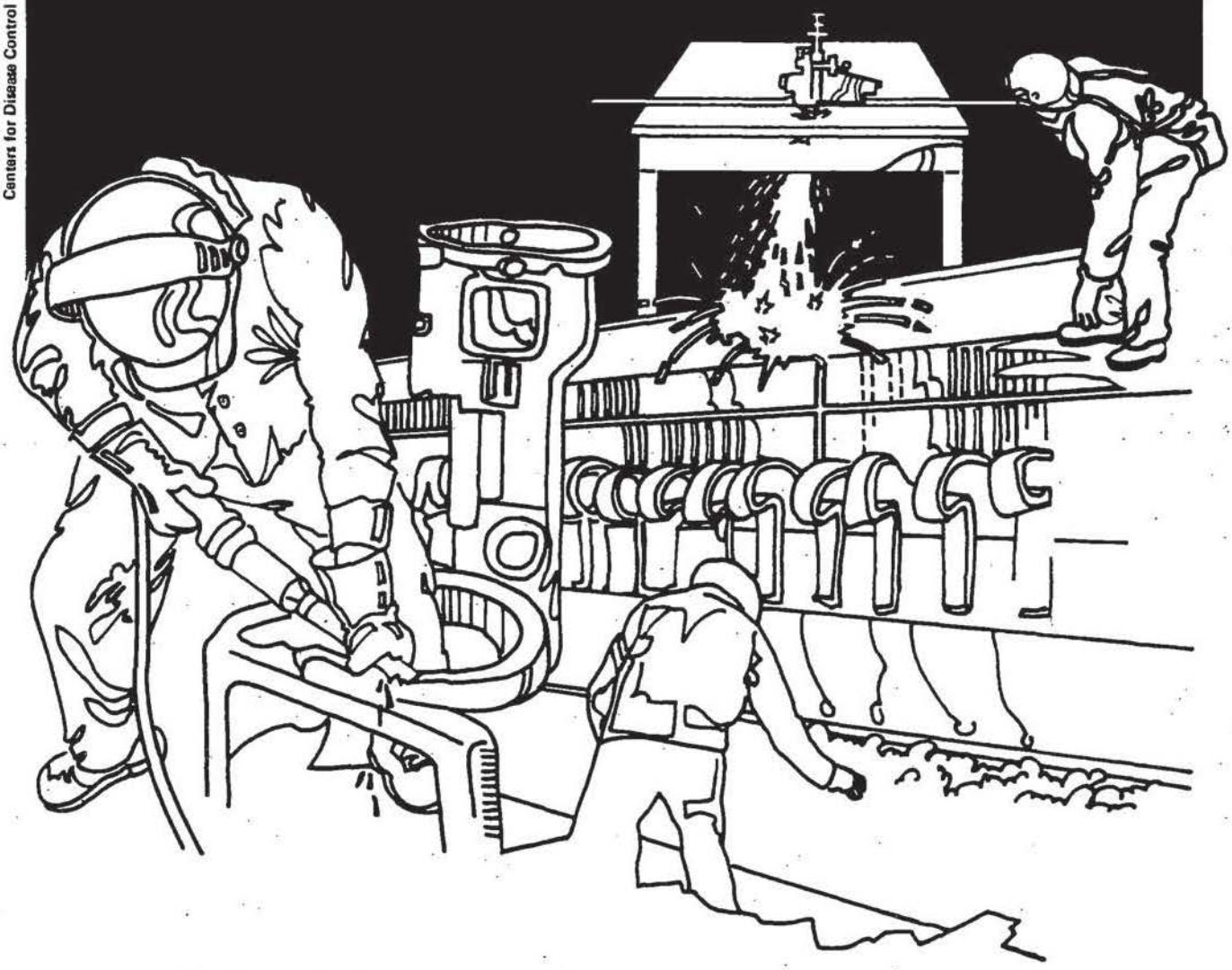

Health Hazard Evaluation Report

HETA 83-421-1446
SHELTERED WORKSHOP
BUTTE, MONTANA

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 83-421-1446
April 1984
SHELTERED WORKSHOP
BUTTE, MONTANA

NIOSH INVESTIGATORS:
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I. SUMMARY

In August, 1983, the National Institute for Occupational Safety and Health (NIOSH) received a request from management of the Butte Sheltered Workshop Inc., Butte, Montana, to evaluate occupational exposures to naphthalene during the manufacturing of felt boot liners.

On September 28, 1983, an industrial hygiene survey was conducted at the sheltered workshop in Butte, Montana. Breathing zone air concentrations of naphthalene were collected on all workers. A total of 17 samples were collected. Naphthalene concentrations ranged from less than 0.001 mg/m^3 to 0.6 mg/m^3. These values are well within the evaluation criterion of 50 mg/m^3. However, it should be noted that production was low at the time of this survey.

All of the workers were informally interviewed. Most of the workers had experienced some irritation to the hands and eyes; however, none had active irritation at the time of this evaluation.

On the basis of the environmental data and personal interviews, NIOSH concluded that a health hazard did not exist at the time of this evaluation to the workers at the Butte Sheltered Workshop, Butte, Montana. Recommendations to help prevent any future problems are included in Section VIII of this report.

KEYWORDS: SIC 3131 -(Boot and Shoe Cut Stock and Findings), naphthalene, felt, dermatitis

II. INTRODUCTION

In August 1983 the National Institute for Occupational Safety and Health (NIOSH) received a request from management to evaluate potential exposures to naphthalene among employees working with felt treated with naphthalene for mothproofing.

On September 28, 1983, an industrial hygiene survey was conducted. Breathing zone air samples for naphthalene were collected. Management was notified of environmental results in October 1983.

III. BACKGROUND

The Butte Sheltered Workshop employs about 12 workers in the felt bootliner factory. Large sheets of felt about 1/4 inch thick measuring about 4 feet by 10 feet are cut into boot liners and then assembled by workers using sewing machines. The felt is treated with naphthalene.

IV. ENVIRONMENTAL DESIGN AND METHODS

A. Environmental

A total of 17 naphthalene breathing zone air samples were collected on either organic vapor charcoal sampling tubes or ORBO sampling tubes using vacuum pumps operated at 50 cc/minute. These samples were analyzed by NIOSH Method S-292 with modifications.

V. EVALUATION CRITERIA

A. Environmental

As a guide to the evaluation of the hazards posed by workplace exposures, NIOSH field staff employ environmental evaluation criteria for assessment of a number of chemical and physical agents. These criteria are intended to suggest levels of exposure to which most workers may be exposed up to 10 hours per day, 40 hours per week for a working lifetime without experiencing adverse health effects. It is, however, important to note that not all workers will be protected from adverse health effects if their exposures are maintained below these levels. A small percentage may experience adverse health effects because of individual susceptibility, a pre-existing medical condition, and/or a hypersensitivity (allergy).

In addition, some hazardous substances may act in combination with other workplace exposures, the general environment, or with medications or personal habits of the worker to produce health effects even if the occupational exposures are controlled at the level set by the evaluation criterion. These combined effects are often not considered in the evaluation criteria. Also, some substances are absorbed by direct contact with the skin and mucous membranes, and thus potentially increase the overall exposure. Finally, evaluation criteria may change over the years as new information on the toxic effects of an agent become available.

The primary sources of environmental evaluation criteria for the workplace are: 1) NIOSH Criteria Documents and recommendations, 2) the American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values (TLV's), and 3) the U.S. Department of Labor (OSHA) occupational health standards. Often, the NIOSH recommendations and ACGIH TLV's are lower than the corresponding OSHA standards. Both NIOSH recommendations and ACGIH TLV's usually are based on more recent information than are the OSHA standards. The OSHA standards also may be required to take into account the feasibility of controlling exposures in various industries where the agents are used; the NIOSH-recommended standards, by contrast, are based solely on concerns relating to the prevention of occupational disease. In evaluating the exposure levels and the recommendations for reducing these levels found in this report, it should be noted that industry is legally required to meet only those levels specified by an OSHA standard.

A time-weighted average (TWA) exposure refers to the average airborne concentration of a substance during a normal 8 to 10 hour workday. Some substances have recommended short-term exposure limits or ceiling values which are intended to supplement the TWA where there are recognized toxic effects from high short-term exposures.

	Permissible Exposure Limits 8-Hour Time-Weighted Exposure Basis
Naphthalene	50 mg/m^3 NIOSH, OSHA, TLV

mg/M^3 = milligrams of substance per cubic meter of air.

B. Toxicological

Naphthalene[1] -- Naphthalene is usually a white crystalline solid. Its major use is as a moth repellant and in dye manufacturing.

Naphthalene is a hemolytic agent and an irritant of the eyes and may cause cataracts.

Acute overexposures to naphthalene causes eye irritation, headache, confusion, excitement, malaise, sweating, nausea, vomiting, abdominal pain, and bladder irritation.

Chronic low exposures may cause hypersensitivity dermatitis; chronic dermatitis is rare. Maintaining exposures below 50 mg/m^3 will protect an individual from adverse health effects.

VI. ENVIRONMENTAL RESULTS

A total of 17 breathing zone air samples were taken for measurement of exposure to naphthalene. Values ranged from less than 0.001 mg/m^3 to 0.6 mg/m^3.

Employee interviews showed few complaints. All the employees expressed the feeling that exposures had been much higher in the past. Most of the workers had experienced dermatitis and eye irritation. The survey was conducted at a time when production was low. This facility has no local exhaust or general ventilation.

VII. DISCUSSION AND CONCLUSIONS

Based on the environmental data and the employee interviews, a hazard did not exist during this survey. When production of the boot liners reaches maximum output there could be a health problem due to the naphthalene exposures. This could occur due to the inadequate local exhaust ventilation and lack of humidity. It would be advisable to conduct another evaluation during peak production.

VIII. RECOMMENDATIONS

1. Install ventilation in close proximity to the sewing machines & cutting machines.

2. Install a humidifier in the assembly area.

3. Provide all workers with an annual physical with emphasis on the skin and eyes.

IX. REFERENCES

Proctor, N.H. and Hughes, J.P. Chemical Hazards of the Workplace. J.B. Lippincott Company, Philadelphia, 1978, p. 367.

X. AUTHORSHIP AND ACKNOWLEDGMENTS

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XI. DISTRIBUTION AND AVAILABILITY

Copies of this 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 Service (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:

1. Sheltered Workshop Inc.
2. U.S. Department of Labor/OSHA - Region VIII.
3. NIOSH - Region VIII.
4. Montana State Department of Health and Environmental Sciences.

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

Breathing Zone Air Concentrations of
Naphthalene at The Sheltered Workshop, Inc.
Butte, Montana

September 28, 1983

Sample Number	Job	Location	Sampling Time	mg/m^3 Naphthalene
3	Cutter	All Locations	8:06-10:10	0.001
4	Sewing	All Locations	8:05-10:10	0.001
5	Mover	All Locations	8:09-10:10	*
6	Sewing	All Locations	8:10-10:10	0.001
9	Trainer	All Locations	8:25-9:55	*
10	Sewing	All Locations	10:10-2:20	*
11	Inspector	All Locations	10:10-3:15	0.001
13	Janitor	All Locations	10:17-3:08	0.001
14	Sewing	All Locations	10:20-4:05	0.001
15	Secretary	Office	10:30-11:00	*
16	Sewing	All Locations	10:35-2:00	0.001
17	Trainer	All Locations	10:40-4:00	0.001
1a	Inspector	All Locations	8:06-10:10	*
2a	Janitor	All Locations	8:05-10:10	*
7	Secretary	Office	8:20-2:00	*
8	Supervisor	All Locations	8:20-2:00	0.6
12	Cutter	Cutting Machine	10:15-11:10	*
EVALUATION CRITERIA				50

LABORATORY LIMIT OF DETECTION: 0.01 mg/Sample

* = below laboratory limit of detection