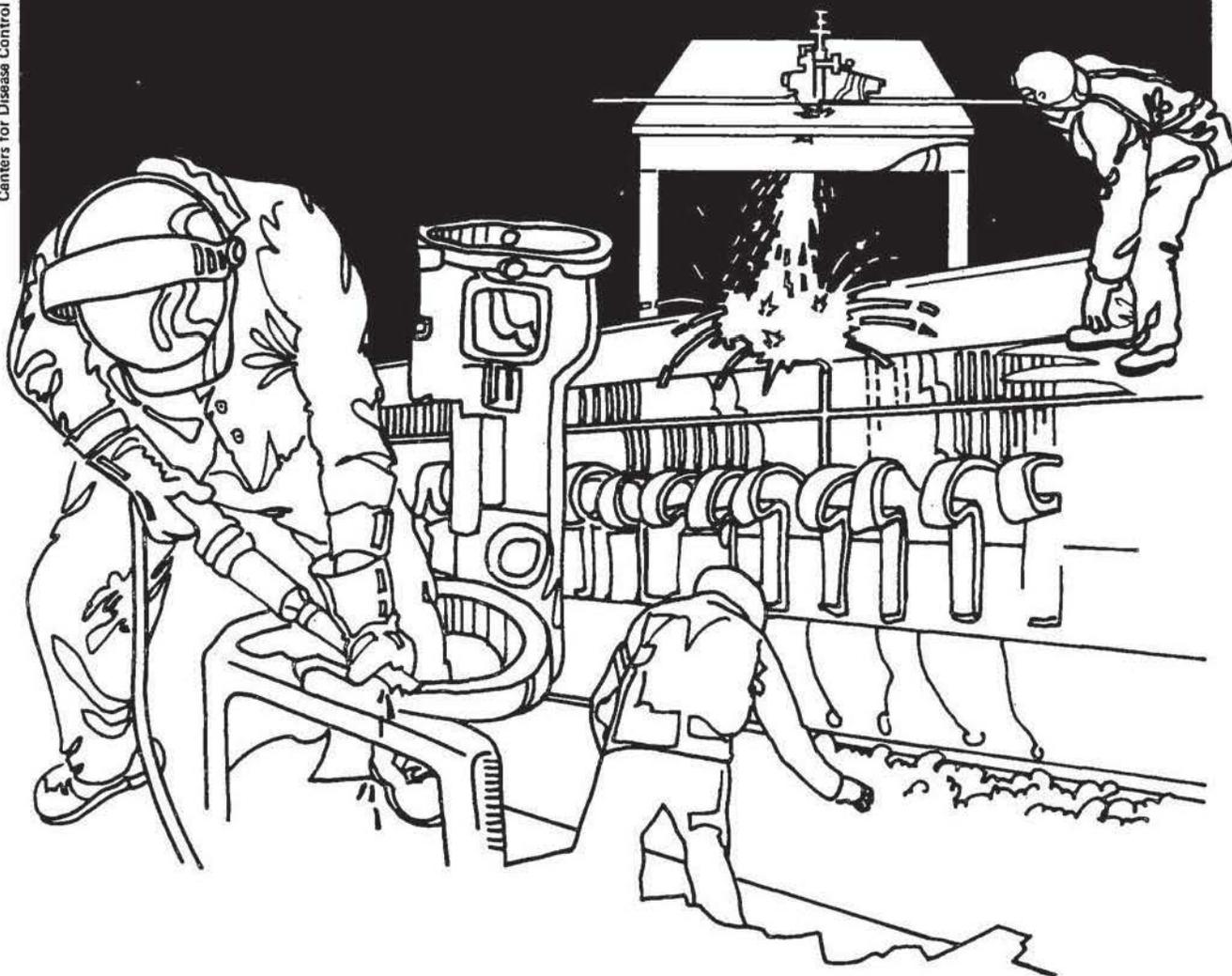


NIOSH



Health Hazard Evaluation Report

HETA 81-378-1000
KEYSTONE DIESEL ENGINE COMPANY
WEXFORD, PENNSYLVANIA

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.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HETA 81-378-1000
November 1981
Keystone Diesel Engine Company
Wexford, Pennsylvania

NIOSH INVESTIGATOR
Raymond L. Ruhe, I.H.

I. SUMMARY

On July 6, 1981 the National Institute for Occupational Safety and Health (NIOSH) received a request from Local 1060, International Association of Machinists and Automotive Workers for a health hazard evaluation at Keystone Diesel Engine Company, Wexford, Pennsylvania to evaluate employee exposures to chemicals used while cleaning diesel engine parts. On July 28, 1981 NIOSH conducted an industrial hygiene survey to determine airborne concentrations of the cleaning chemicals and interviewed exposed workers for past and present symptoms associated with exposure to these chemicals.

The parts cleaning operators were exposed to a maximum air concentration of methylene chloride of 27 mg/m³. NIOSH recommends that exposure to methylene chloride not exceed 261 mg/m³ for an 8-hour time-weighted average (TWA) exposure. Air concentrations of hydrogen chloride, sodium hydroxide, mineral oil, and cresylic acid were all below the limit of detection.

The two parts cleaning operators interviewed reported no health problems at the time of the NIOSH survey.

Based on the results of this survey, NIOSH concludes that a health hazard to chemicals used while cleaning diesel engine parts did not exist at the time of this survey. Recommendations are made for improved training of workers and for improved housekeeping at the plant.

KEYWORDS: SIC 3519 (Internal Combustion Engines), methylene chloride, hydrogen chloride, sodium hydroxide, mineral oil, and cresylic acid.

II. INTRODUCTION

On July 6, 1981, NIOSH received a request from Local 1060, International Association of Machinists and Automotive Workers to determine if there was a health hazard from exposure to chemicals used while cleaning diesel engine parts at Keystone Diesel Engine Company, Wexford, Pennsylvania. An environmental survey was conducted on July 28, 1981 to evaluate potential chemical exposures by the two parts cleaning operators. Preliminary findings of this evaluation were reported in a letter on August 20, 1981, to the union and management.

III. BACKGROUND

The Keystone Diesel Company builds and repairs diesel engines, together with providing customers with training, sales, service and parts assistance. The company employs 64 persons and occupies a one-story building with approximately 45,000 square feet.

The parts cleaning room is approximately 20' x 40' and is located in the rear of the building. When diesel engines come in for repair, the parts of the engine are removed and cleaned by using different chemicals, solvents, water and steam, depending on the type of metal being cleaned. The parts cleaning responsibility involves one person for a maximum of 4 hours per 8 hour workday. The parts cleaning responsibility is shared between two workers and does not necessarily occur on a daily basis.

IV. ENVIRONMENTAL DESIGN AND METHODS

Personal breathing zone samples were collected on the parts cleaning operator for methylene chloride via charcoal tube using a vacuum pump operating at 0.5 liters per minute and analyzed according to NIOSH Method P&CAM No. 127.

Personal breathing zone sample for hydrogen chloride was collected via a special silica gel tube (SKC 226-10-03) using a vacuum pump operating at 0.20 liters per minute and analyzed according to NIOSH Method P&CAM No. 310.

Personal breathing zone and general area samples for sodium hydroxide were collected using a vacuum pump with pre-weighed M-5 filter at a flow rate of 1.7 liters/minute and analyzed according to NIOSH Method P&CAM No. 173.

A general area sample for mineral oil was collected by using MSA, Model G, battery-operated vacuum pump with a AA filter at a flow rate at 1.7 liters/minute and analyzed by NIOSH Method P&CAM No. 159.

A personal breathing zone sample for cresylic acid was collected via a silica gel tube using a vacuum pump operating at 0.20 liters per minute and analyzed by NIOSH Method P&CAM No. S-167.

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 air samples collected for methylene chloride, hydrogen chloride, sodium hydroxide, mineral oil, and cresylic acid. The maximum concentration of methylene chloride (27 mg/M^3) was less than 10% of the 261 mg/M^3 NIOSH recommended standard. Air concentrations of the other contaminants were not detected at the lowest level capable of being measured by the analytical methods.

The two parts cleaning operators interviewed reported no health problems on the day of the survey. This is consistent with the level of methylene chloride measured.

Based on the environmental sampling results, employee interviews and available toxicological information, NIOSH concludes that a health hazard did not exist at the time of this survey on July 28, 1981.

VII. RECOMMENDATIONS

1. An education and training program for the parts cleaning operators should include (as a minimum) the following information.
 - a. The properties and acute and chronic health effects of the chemicals to which the employees are routinely exposed in the workplace.
 - b. An appreciation of the usefulness and limitations of odor threshold limit values. Such an appraisal would enable the worker to respond appropriately to odors detected during his workday.
2. Good personal hygiene and good work practices should be observed by all employees. Washing of hands before smoking, eating and drinking will help reduce contamination.

3. All containers containing chemicals, solvents and acids should be properly marked.

VIII. AUTHORSHIP AND ACKNOWLEDGEMENTS

Evaluation Conducted and Report
Prepared By:

Raymond L. Ruhe
Industrial Hygienist
Industrial Hygiene Section

Evaluation Assistance:

Steven A. Lee
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:

Patty Johnson
Secretary
Industrial Hygiene Section

VIII. DISTRIBUTION AND AVAILABILITY OF REPORT

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 22161.

Copies of this report have been sent to:

1. Keystone Diesel Engine Company
2. Local 1060, International Association of Machinists and Automotive Workers
3. NIOSH, Region III
4. OSHA, Region III

For the purposes of informing the two 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

RESULTS OF PERSONNEL BREATHING ZONE AND GENERAL AREA CONCENTRATION OF METHYLENE
 CHLORIDE, HYDROGEN CHLORIDE, SODIUM HYDROXIDE, MINERAL OIL AND CRESYLIC ACID
 KEYSTONE DIESEL ENGINE COMPANY
 WEXFORD, PENNSYLVANIA
 JULY 28, 1981

JOB AND/OR LOCATION	SAMPLING PERIOD	SAMPLE VOLUME (LITERS)	METHYLENE CHLORIDE mg/M ³ *	HYDROGEN CHLORIDE mg/M ³	SODIUM HYDROXIDE mg/M ³	MINERAL OIL mg/M ³	CRESYLIC ACID mg/M ³
Parts Cleaning Operator	0940-1005	1.3	27	--	--	--	--
Parts Cleaning Operator	0830-1010	5.1	--	LD**	--	--	--
General Area (Sub-Assembly Room)	0820-1005	178.	--	--	LD	--	--
General Area (Parts Cleaning Room)	0818-1005	182.	--	--	LD	--	--
Parts Cleaning Operator	0824-1010	180.	--	--	LD	--	--
General Area (Oil Bath)	0822-1005	175.	--	--	--	LD	--
Parts Cleaning Operator	0940-1005	4.8	--	--	--	--	LD
Environmental Criteria (mg/M ³)			261 mg/m ³	7 mg/m ³ ceiling	2 mg/m ³ ceiling	5 mg/m ³	22 mg/m ³
Limit of Detection (mg)		0.01mg	0.01 mg	.003 mg	0.01 mg		0.01 mg

* mg/M³ = milligrams of substance per cubic meter of air sampled.

**LD = less than detectable limits

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

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE. \$300

Third Class Mail



POSTAGE AND FEES PAID
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
HHS 396