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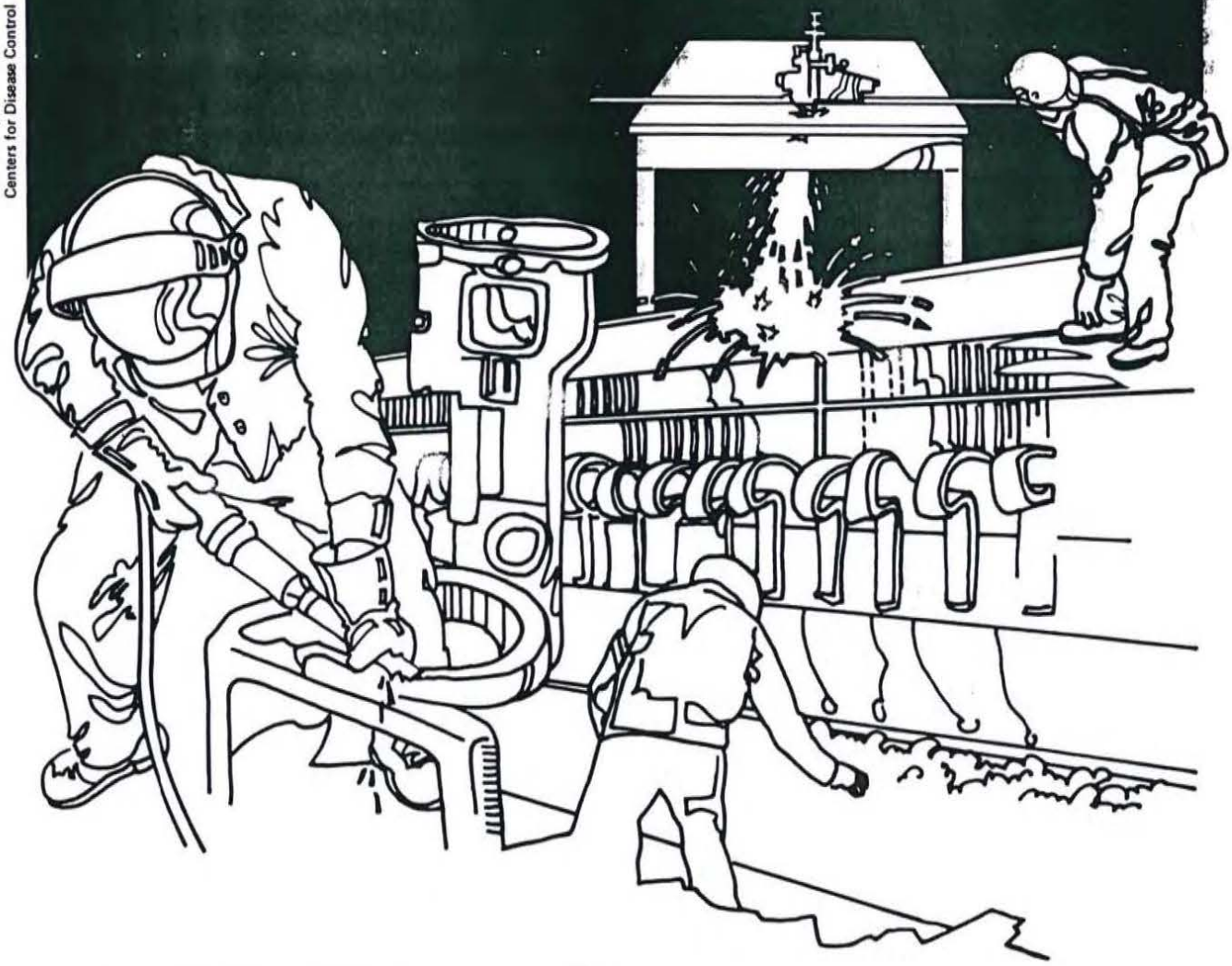

Health Hazard Evaluation Report

HETA 81-333-935
NATIONAL CENTER FOR HEALTH STATISTICS
HYATTSVILLE, MARYLAND

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 81-333-935
August 1981
National Center for Health Statistics
Hyattsville, Maryland

NIOSH INVESTIGATOR:
Richard J. Costello

I. SUMMARY

On May 20, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a telephone request from employees of the National Center for Health Statistics (NCHS) to investigate symptoms of respiratory, eye, nose, and throat irritation associated with exposures to two duplicating machines adjacent to their assigned office space. The requestors were occasional copier users. A NIOSH industrial hygienist conducted employee interviews and collected fourteen air samples for contaminants possibly associated with these operations on May 21, 1981.

No substance was detected which exceeded any of the evaluation criteria. Branched C_{10} - C_{12} alkanes were detected at concentrations of 4.2 to 7.9 ug/M^3 of total hydrocarbons. Single measurements of 4.9 ug/M^3 of both iron and tin were made.

The grab samples for ozone and carbon monoxide were below the limit of detection. Very small amounts of toluene, perchloroethylene, and xylene were detected, but at levels below the limit of quantification. Isopropanol was detected, but could not be quantitated. Fluoranthene, pyrene, benz(a)anthracene, benzo(e)pyrene, and benzo(a)pyrene were not detected. Airborne aluminum, arsenic, beryllium, calcium, cadmium, cobalt, chromium, copper, lead, lithium, magnesium, manganese, molybdenum, phosphorus, platinum, selenium, silver, sodium, tellurium, titanium, thallium, vanadium, yttrium, zinc, and zirconium were not detected.

Particulate contaminants were evaluated. The median area diameter of airborne particles was 0.204 microns. Small circular particles composed of tin were observed. Removable particulate matter contained no asbestos fibers, but did contain gypsum, silica, calcite, aluminum silicates, iron, titanium, sulfur and phosphorus.

The temperature and humidity were maintained at about 72° F dry bulb and 60° wet bulb which may be perceived as comfortable to slightly cool.

NIOSH concluded that there was no chemical hazard in this office space and that there was no excessive thermal stress.

KEYWORDS: SIC 9431, Copy Machines, Office Workers, Administration of Public Health Programs (Health Statistics Centers).

II. INTRODUCTION AND BACKGROUND

On May 20, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a telephone request from three employees of the National Center for Health Statistics (NCHS), Hyattsville, Maryland, to investigate symptoms of respiratory, eye, nose, and throat irritation. The symptoms were described as having sudden onset in the same time frame as the relocation of two copying machines, a Xerox and a Savin, to a room adjacent to the requestors' assigned office space. A NIOSH industrial hygienist was assigned to investigate. Employee interviews and air sampling were conducted on May 21, 1981. Since the same NCHS building was also the subject of an on-going Centers for Disease Control study of possible pulmonary disfunction due to airborne organisms, this survey was restricted to potential chemical exposures.

III. METHODS

The employees who expressed symptoms were interviewed. Area samples for organic vapors, metals, polynuclear armoatic hydrocarbons (PNAs), asbestos, and airborne and removable particulate matter were selected to screen for the maximum number of airborne chemical substances. One group of sampling devices was positioned in the copying room beneath the exhaust grill adjacent to the private office of one of the employees who expressed discomfort. Additional area samples were collected in the private office of one of the employees who expressed discomfort and on a desk in the near-by general office space. The sampling and analytical methods are described in Appendix I. Grab samples using direct reading instruments were collected for carbon monoxide and ozone. Air temperature, air velocities and relative humidity were measured and recorded.

IV. EVALUATION CRITERIA

Applicable proposed occupational health standards and regulatory criteria are presented in Appendix II.

V. RESULTS

Employee interviews confirmed the telephone complaints of respiratory, eye, nose and throat irritation in the same time frame as the relocation of two copying machines, a Xerox and a Savin, to a room adjacent to their assigned office space.

No substance was detected in excess of the evaluation criteria. The grab samples for ozone and carbon monoxide were below the limit of detection for the direct reading indicator tubes used. Sufficient air was aspirated through them to insure maximum sensitivity of the result.

Very small amounts of toluene, perchloroethylene, and xylene were detected on the charcoal tube samples, but at levels below the limit of quantification. The major peaks were identified as isopropanol and branched C_{10} - C_{12} alkanes. The isopropanol could not be quantitated. The quantifiable results are presented in Table 1. They were 4.2 to 7.9 ug/M^3 of total hydrocarbons (mean, 5.5, standard deviation 2.1) in the copy room and office space. Single measurements of 4.9 ug/M^3 of both iron and tin were made in the private office space formerly occupied by one of the requestors.

One filter, which was exposed in the copying room, was analyzed for five PNAs which may be carcinogenic (fluoranthene, pyrene, benz(a)anthracene, benzo(e)pyrene, and benzo(a)pyrene). These substances were not detected.

One set of three filters were scanned for aluminum, arsenic, beryllium, calcium, cadmium, cobalt, chromium, copper, lead, lithium, magnesium, manganese, molybdenum, phosphorus, platinum, selenium, silver, sodium, tellurium, titanium, thallium, vanadium, yttrium, zinc, and zirconium. None of these substances were detected.

Another filter, which was exposed in the copying room, was analyzed to determine the size of collected particles and to screen for asbestos. The particles captured were very small. The median area diameter was 0.204 microns and the mass median diameter, calculated with an assumed particle specific gravity of 1.0, was 0.66 microns. Small circular particles composed of tin were observed. A single crystalline fiber which was composed of sodium, magnesium, silicon, and iron was detected. Its shape and composition is consistent with amphibole, a form of asbestos.

Removable particulate matter was evaluated by bulk swipe samples which were collected from the air supply and exhaust diffusers in the copy room, the private office formerly occupied by one of the requestors, and in the general office space adjoining the private office. No asbestos fibers were observed. All of the samples contained particles composed of calcium and sulfur, proabably gypsum, some silica and various mineral particles such as calcite. Aluminum silicates, iron, titanium, sulfur and phosphorus were also detected.

The estimated air supply in the copying room and the private office was in excess of 30 air changes per hour. The air temperature and humidity was maintained at a constant 72° F and 50%. The ASHRAE comfort chart suggests that this temperature and humidity combination may be perceived as comfortable to slightly cool, provided that air movement is restricted to 15-25 feet per minute.[1] Measured air velocity at desk top level was approximately 50 fpm which would increase the sensation of coolness.

VI. DISCUSSION AND RECOMMENDATIONS

All quantifiable chemical substances detected on this survey were at very low levels. In general it is not suprising to find natural and man-made chemicals in the environment using sensitive and relatively sophisiticated analytical techniques. The quantified levels of tin are well below the occupational health standard and the measured levels of branched alkanes are below total hydrocarbon ambient air quality standards accepted in this country and abroad.[2]

The temperature and humidity conditions could be perceived as slightly cool by some individuals, but do not deviate significantly from recognized norms.

There is no evidence in this study to suggest that the symptoms expressed by NCHS employees were related to a chemicals released by the copying machings.

VIII. REFERENCES

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9. U.S. Department of Labor, Occupational Safety and Health Administration: General Industry Standards 29 CFR 1910.1000, Table Z-1.

IX. AUTHORSHIP AND ACKNOWLEDGEMENTS

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X. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, 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), 5285 Port Royal Road, Springfield, Virginia 22151. Information regarding its availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies of this report have been sent to:

1. Individual Requestors, National Center for Health Statistics, Hyattsville, Maryland

2. Deputy Executive Officer, National Center for Health Statistics, Hyattsville, Maryland

3. Chief, Special Studies Branch, Chronic Disease Division, Centers for Disease Control, Atlanta, Georgia 30333.

TABLE 1
SAMPLE RESULTS
NATIONAL CENTER FOR HEALTH STATISTICS
HYATTSVILLE, MARYLAND

June 21, 1981

Location	Total Hydrocarbons ug/M^3	Iron ug/M^3	Tin ug/M^3
Copy Room	7.9	N.D.	N.D.
Private Office	4.5	4.9	4.9
General Office	4.2	N.D.	N.D.

Note: N.D. means not detected

APPENDIX I

SAMPLING AND ANALYSIS METHODOLOGY
NATIONAL CENTER FOR HEALTH STATISTICS
HYATTSVILLE, MARYLAND

June 21, 1981

Substance	Collection Device	Flow Rate	Duration	Analytical Method	Limit of Detection	Reference
Asbestos	Nucleopore Filter	2.0 lpm	4 hours	Energy Dispersive X-Ray Analysis Selected Area Electron Diffraction	____	3
Metals and Elements	PVC Filter	2.0 lpm	3 - 4 hours	Inductively Coupled Plasma Atomic Emission Spectrometry	1.0 ug	4
Organic Vapors	Charcoal Tube	1.0 lpm	3 - 4 hours	Gas Chromatrography Mass Spectrometry	----	5
Particle Size	Nucleopore Filter	2.0 lpm	4 hours	Electron Microscopy	____	6
PNAs	Glass Fiber/Silver Membrane Filter	2.0 lpm	4 hours	Reverse Phase Liquid Chromatography	0.1 ug	7
Removable Particulates	Whatman 41 Swipe Tabs	N/A	N/A	Transmission Electron Microscopy Energy Dispersive X-Ray Analysis	Qualative	8

APPENDIX II

ENVIRONMENTAL EVALUATION CRITERIA
NATIONAL CENTER FOR HEALTH STATISTICS
HYATTSVILLE, MARYLAND

June 21, 1981

Substance	OSHA Standard 8-Hour TWA ug/M^3	Reference
Tin	2,000	9

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