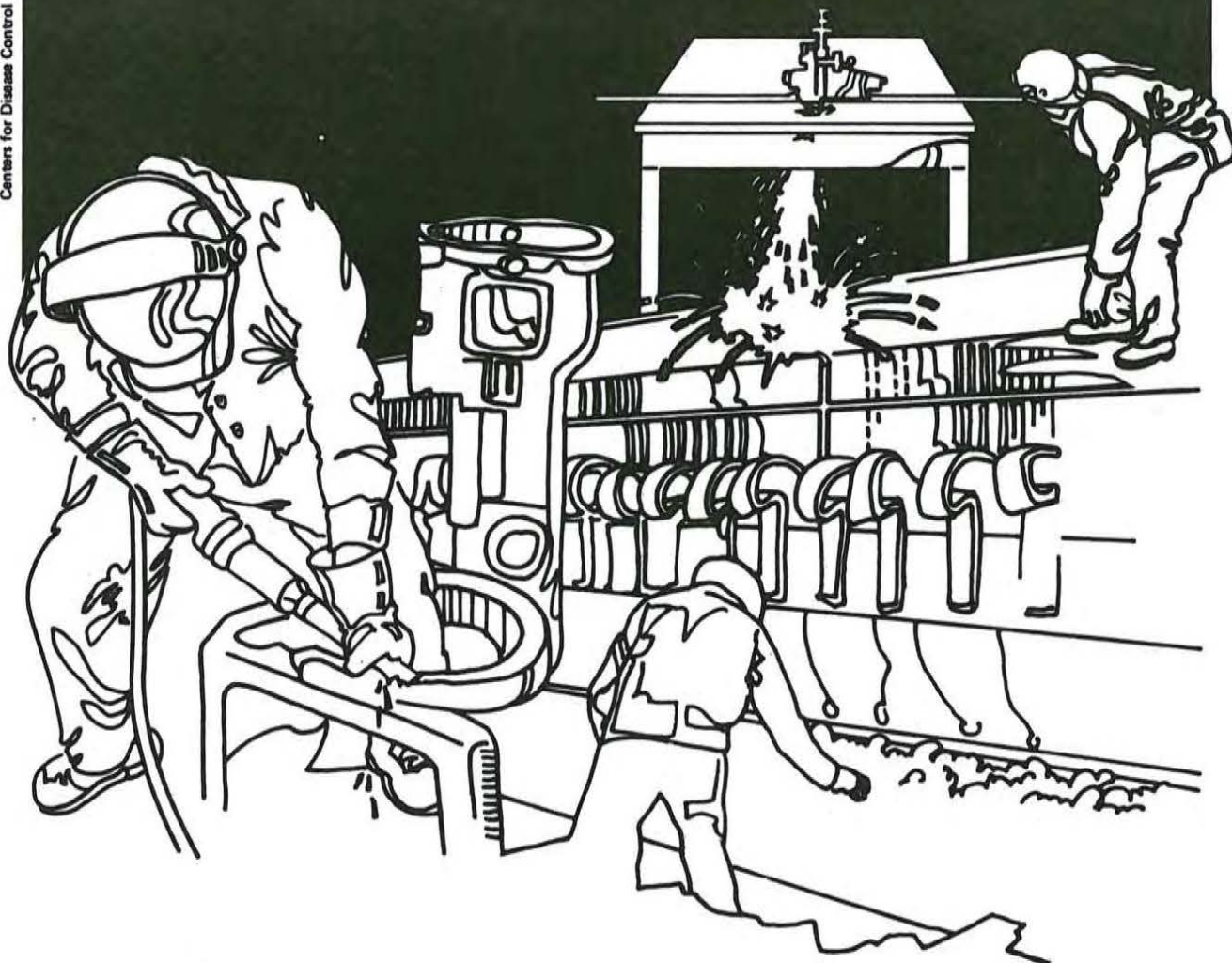


# NIOSH



## Health Hazard Evaluation Report

HETA 82-196-1187  
U.S. DEPARTMENT OF TREASURY,  
BUREAU OF GOVERNMENT FINANCIAL OPERATIONS  
WASHINGTON, D.C.

## 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.

## I. SUMMARY

In March 1982, the National Institute for Occupational Safety and Health (NIOSH) received a request for a health hazard evaluation from the Safety Division of the U.S. Department of Treasury, Washington, D.C. Workers there were reporting adverse health effects that they associated with inadequate ventilation of their offices. Twenty-four employees worked in this area at the time of the NIOSH visit.

On May 6, 1982, NIOSH conducted environmental sampling and employee interviews. Thirteen of the 14 employees interviewed believed that their office ventilation was unsatisfactory. Four people simply stated that the offices were too hot and stuffy in the summer. Five others reported sinus problems that they associated with stuffy office air. Of these, two said the problem was worse in spring, two had more problems in summer, and one said that winter was worse. Four other employees reported a variety of symptoms.

Short-term colorimetric detector tubes were used in Area 326 to measure carbon monoxide (CO), oxides of nitrogen (NO + NO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), ozone (O<sub>3</sub>), and formaldehyde (HCHO). All levels were below the limits of detection (CO <5 ppm; NO + NO<sub>2</sub> <0.5 ppm; CO<sub>2</sub> <0.1%; O<sub>3</sub> <0.05 ppm; and HCHO <0.5 ppm).

One bulk air sample was collected on activated charcoal in Area 326 for identification of organic vapors. The sample was drawn by a battery-powered sampling pump operating at 2.0 liters per minute for 2 hours, and later analyzed by gas chromatography/mass spectrophotometry. Small amounts of 1,1,1-trichloroethane, toluene, xylene, and various C<sub>8</sub>-C<sub>12</sub> aliphatic hydrocarbons were detected. These compounds are commonly found in office buildings, generally, at concentrations over a thousand times lower than any current occupational health criteria. Thus, their presence must be considered insignificant.

The Treasury Annex was built in 1919 and has six floors. Fresh air is supplied from ground level by four air handlers located on the west side (near Madison Street) of the building. Each floor has two return air vents. During the spring and autumn 100% outside air is supplied, and during the summer 33% of the air is recirculated to conserve air-conditioning. During the winter months, however, no outside air is supplied and no air is circulated. The building is heated by hot water radiators. Building managers stated that the reason no air was supplied or circulated was because too much heat was already being lost through the leaky windows of the old building.

No health hazards due to the presence of hazardous substances were found by NIOSH at the time of this investigation. However, deficiencies in building ventilation probably account for much of the discomfort among employees located in interior offices.

NIOSH recommends that air circulation be increased for employee comfort.

KEYWORDS: SIC 9199, office building, office workers, office air quality, office ventilation.

## II. RECOMMENDATIONS

The ventilation system in the Treasury Annex Building should be redesigned so that fresh air is uniformly supplied to all the occupied areas. Air supply and circulation also should be increased, particularly during the winter, to help improve office working conditions. The building is too large to assume that natural ventilation from windows will reach employees located in interior offices unless the building is redesigned to fit an open office concept with very few walls or partitions to obstruct the flow of air.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) should be consulted when redesigning ventilation systems. ASHRAE recommends that at least 5 cubic feet per minute (CFM) per person of outside air be supplied to offices. At least 20 CFM per person should be supplied in areas where smoking is permitted.<sup>1</sup>

## III. REFERENCE

1. American Society of Heating, Refrigerating, and Air Conditioning Engineers. Ventilation for Acceptable Indoor Air Quality. Atlanta, Georgia: American Society of Heating, Refrigerating, and Air Conditioning Engineers, 1981 (ASHRAE Standard 62-1981).

## IV. AUTHORSHIP AND ACKNOWLEDGEMENTS

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## V. 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. U.S. Department of Treasury
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