U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 78-128-549

NIXON POWER PLANT
COLORADO SPRINGS, COLORADO

DECEMBER, 1978

I. TOXICITY DETERMINATION

A health hazard evaluation was conducted by the National Institute for Occupational Safety and Health (NIOSH) at the Nixon Power Plant in Colorado Springs, Colorado, on September 29, 1978. Breathing zone air samples were taken for asbestos. Asbestos concentrations ranged from 0.02 fibers per cubic centimeter greater than 5 microns in length (fibers/cc > 5μ) to 0.187 fibers/cc > 5μ. The OSHA standard (2 fibers/cc) was not exceeded; however, since asbestos concentrations approached or exceeded the NIOSH criteria of 0.1 fibers/cc (8 hour Time Weighted Average (TWA), a potential health hazard exists and workers should be protected by proper use of respirators until local exhaust ventilation is provided.

II. DISTRIBUTION AND AVAILABILITY

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), 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. Natkin Construction
2. U.S. Department of Labor/OSHA - Region VIII
3. NIOSH - Region VIII.

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

III. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by 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.

NIOSH received such a request from the Vice President, Natkin Construction, Englewood, Colorado, to evaluate potential asbestos exposures to plumbers sanding asbestos joints and connections.

IV. HEALTH HAZARD EVALUATION

A. Process Evaluated

Asbestos connections and small joints are sanded and buffed prior to gluing them onto fiberglass pipe. During the sanding and buffing of the asbestos connections, it is possible for air-borne asbestos fibers to be generated. This process was evaluated during this survey.

B. Evaluation Design and Methods

Breathing zone air samples were collected on the plumbers during the sanding and buffing of the asbestos connections. The workers were monitored during an entire normal process. Samples were collected on open face AA filters and were analyzed according to NIOSH method P&CAM #239 utilizing phase contrast microscopy.

C. Criteria for Assessing Workroom Concentrations Air Contaminants

Three sources of criteria generally used to assess workroom concentrations of air contaminants are: (1) NIOSH criteria for recommended standards; (2) recommended Threshold Limit Values (TLVs) and their supporting documentation as set forth by the American Conference of Governmental Industrial Hygienists (ACGIH), 1978; and (3) Occupational Safety and Health Administration (OSHA) standards (29 CFR 2920), January 1976. NIOSH criteria and ACGIH TLVs represent the most recent and relevant recommendations and are given prominence in this evaluation. Values listed are 8 hour time weighted average concentration limits, except where a ceiling limit (C) is noted.

	NIOSH	TLV	OSHA
Asbestos[1]	0.1 fibers/cc C-0.5 fibers/cc[2]	2 fibers/cc[3]	2 fibers/cc

[1] fibers per cubic centimeter of air, greater than 5 microns in length.
[2] peak concentration for 15 minute period.
[3] notice of intended changes 1978 TLVs.

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.

D. Toxicology

Asbestos - Available studies provide conclusive evidence that exposure to asbestos fibers causes cancer and asbestosis in man. Lung cancers and asbestosis have occurred following exposure to chrysotile, crocidolite, amosite, and anthophyllite. Mesotheliomas, lung and gastrointestinal cancers have been shown to be excessive in occupationally exposed persons, while mesotheliomas have developed also in individuals living in the neighborhood of asbestos factories and near crocidolite deposits, and in persons living with asbestos workers. Asbestosis has been identified among perosns living near anthophyllite deposits.

Likewise, all commercial forms of asbestos are carcinogenic in rats, producing lung carcinomas and mesotheliomas following their inhalation, and mesotheliomas after intrapleural or intraperitoneal (ip) injection. Mesotheliomas and lung cancers were induced following even 1 day's exposure by inhalation.

The size and shape of the fibers are important factors; fibers less than 0.5 µm in diameter are most active in producing tumors. Other fibers of a similar size, including glass fibers can also produce mesotheliomas following intrapleural or ip injection.

There are data that show that the lower the exposure, the lower the risk of developing cancer. Excessive cancer risks have been demonstrated at all fiber concentrations studied to date.

Evaluation of all available human data provides no evidence for a "safe" level of asbestos exposure. (Reference 1)

E. Results

Breathing zone air samples were collected on two workers during the total time (approximately 2 hours) they were buffing and sanding asbestos connections. These samples were analyzed. Concentrations may be reviewed in Table 1. None of the samples exceeded OSHA standards or the peak concentration criteria established by NIOSH. However, since the potential for high exposure exists, workers should be provided with adequate respiratory protection.

F. Conclusions

The potential for a health hazard exists. Therefore, workers should be trained on the hazards of working with asbestos, as well as proper use of respiratory protective equipment.

V. RECOMMENDATIONS

1. Local exhaust ventilation should be installed at the site where the asbestos connections are being sanded and buffed.

2. Workers should be provided with NIOSH approved respirators.

VI. REFERENCES

1. NIOSH Revised Recommended Asbestos Standard. NIOSH 77-169, December 1976.

VII. AUTHORSHIP AND ACKNOWLEDGMENTS

Report Prepared By: Bobby J. Gunter, Ph.D.
Regional Industrial Hygienist
NIOSH - Region VIII - Denver

Originating Office: Jerome P. Flesch, Acting Chief
Hazard Evaluation and Technical Assistance Branch
NIOSH - Cincinnati

Report Typed By: Marilyn K. Schulenberg
NIOSH - Region VIII - Denver

TABLE 1

Breathing Zone Air Concentrations of Asbestos

Nixon Power Plant
Colorado Springs, Colorado

September 29, 1978

Sample Number	Location	Classification	Time of Sample	Concentration Fibers/cc > 5μ
1	Plumbers Shop	Plumber	8:10 AM - 10:20 AM	0.02
2	Plumbers Shop	Plumber	8:15 AM - 10:30 AM	0.06
3	Plumbers Shop	General Room	8:20 AM - 12:00 PM	0.03
4	Plumbers Shop	General Room	8:20 AM - 12:00 PM	0.187
5	Plumbers Shop	General Room	10:20 AM - 12:00 PM	0.174
6	Plumbers Shop	General Room	10:20 AM - 12:00 PM	0.186
			EVALUATION CRITERIA	0.5 Ceiling 0.1 8-hour TWA