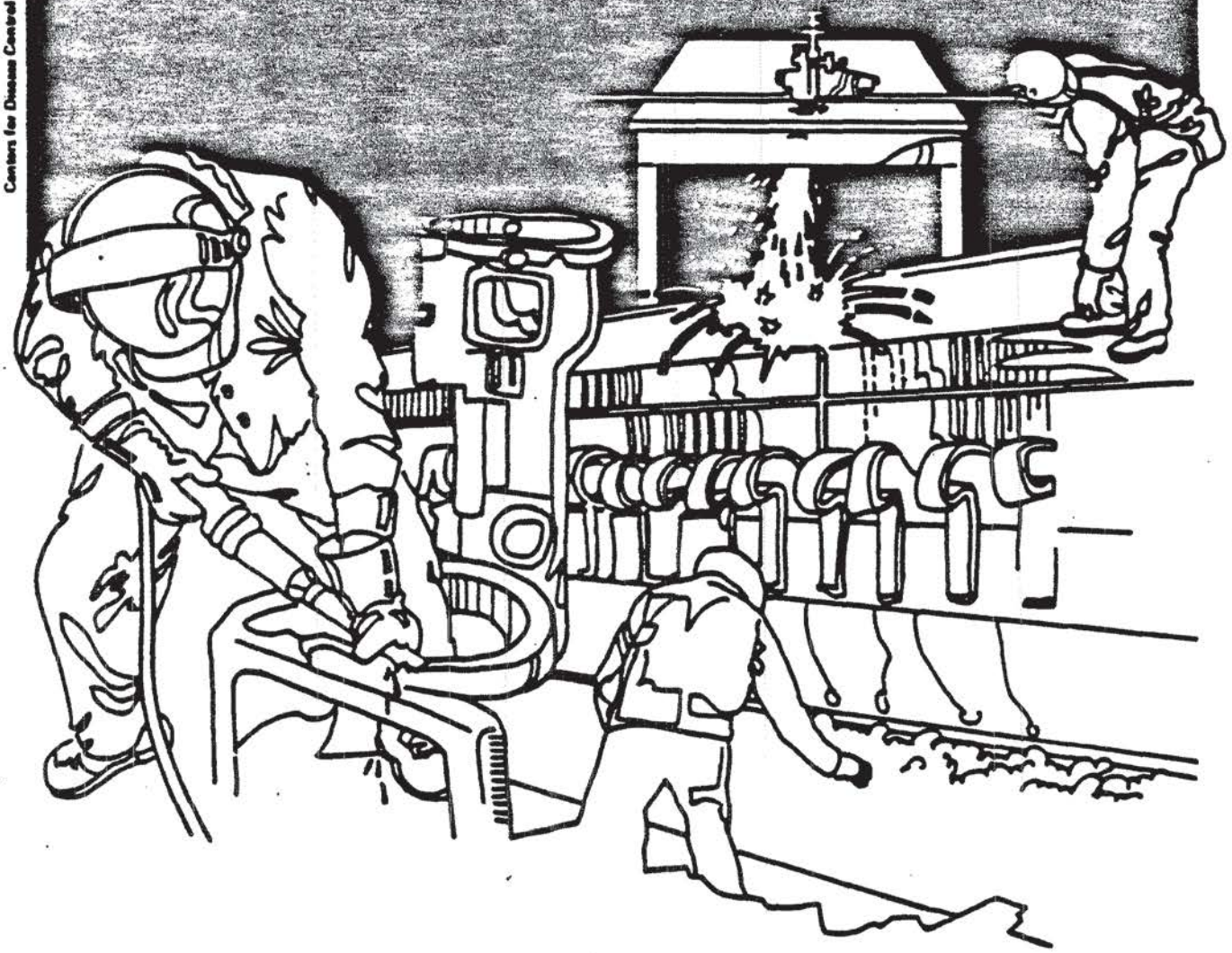
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES • Public Health Service
Centers for Disease Control • National Institute for Occupational Safety and Health

NIOSH



Health Hazard Evaluation Report

HETA 83-246-1610
PUBLIC SERVICE ELECTRIC AND
GAS CORPORATION
ISELIN, NEW JERSEY

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-83-246-1610
JULY 1985
PUBLIC SERVICE ELECTRIC AND GAS CORPORATION
ISELIN, NEW JERSEY

NIOSH INVESTIGATORS:
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I. SUMMARY

In April, 1983, the National Institute for Occupational Safety and Health received a request from the employees' union to evaluate employee complaints of burning, itching, and redness of hands, hives, and irritation of the eyes at the Public Service Electric and Gas Corporation's Customer Payment Processing facility in Iselin, New Jersey. In its request, the union asked also for evaluation of exposure to Paper Fiber Separator Solution, (PFS) used in the facility's AES 3-30 MAILSYSTEM automatic envelope opening machine. NIOSH assigned the evaluation to the New Jersey State Department of Health, (NJSDH) Occupational Health Program, under a Cooperative Agreement, in June, 1983.

To determine if there were exposures or health effects related to the AES 3-30, NJSDH conducted an opening meeting and walkthrough on July 8, 1983, and medical interviews of all 45 workers in the facility on July 20, 1983. NJSDH also obtained samples of PFS and of envelopes opened by the AES 3-30, for laboratory analysis, on January 8, 1984. The AES Corporation reported that PFS contained propylene glycol monomethyl ether (also called 1-methoxy - 2 propanol, or 1-MP) and other components and that chemical analysis of treated envelopes had reported residual 1-MP, and the production of aldehydes, acetone, and sugars when envelopes were opened.

Preliminary interviews of eight employees during the walkthrough revealed that all had one or more symptoms of skin and mucous membrane irritation and of headache. Therefore, irritant symptoms were ascertained from all employees. For purposes of analysis, employees were divided into four groups: payment processors, who spent the workday handling envelopes; clerical personnel, with minimal envelope contact; AES-GIC workers, who worked by the machine and transferred the envelopes to the payment processors, and management, with virtually no envelope or machine contact. Results indicated that symptoms were more prevalent among payment processors and, to a lesser extent, among clerical workers. Among the most frequently reported symptoms, nasal irritation was reported by 15 (53.6%) payment processors, 3 (42.9%) clerical workers; 1 (25%) AES-GIC worker and none (0%) of management; skin redness was reported by 11 (39.3%) payment processors, 1 (14.3%) clerical worker, and none (0%) of both AES-GIC and management; eye irritation was reported by 10 (35.7%) payment processors, 2 (28.6%) clerical workers, 1 (25%) AES-GIC, and none (0%) of management; headache was reported by 6 (21.4%) payment processors, 1 (14.3%) clerical worker, and none (0%) of AES-GIC or management. Payment processors also had the greatest proportion of symptomatic individuals, 75%; clerical workers had 57%, AES-GIC 25%, and management 0% (X^2= 7.24, P=0.0071).

Both management and employees reported that the office's ventilation may have been inadequate, with employees claiming inadequate air movement and a sensation of stuffiness.

Because the AES 3-30 had internal exhaust ventilation, vented to the outside, the likelihood of significant vapor exposure was deemed small. However, there was

visible dust from opened envelopes both inside the machine, and on work surfaces in the payment processing area. Therefore, a sample of PFS and three freshly opened envelopes were sent for laboratory analysis. The PFS contained 18.2% 1-MP; aldehydes, furfural, and acetone all were reported as none detected. The three envelopes had 82.3 mg/kg of 1-MP; aldehydes, furfural, and acetone all were reported as none detected. However, because analysis of these chemicals on envelopes was reportedly difficult, detection limits of the latter chemicals were high, and traces may have been present.

Based on these results, NIOSH concluded that there were skin and mucous membrane irritant symptoms, with associated headaches, related to working in payment processing at PSE&G, Iselin, N.J. The symptoms are associated with the installation of the AES 3-30, and may have been caused by residual chemicals on envelopes treated by the AES 3-30, by envelope dust, inadequate ventilation, or a combination of these factors. The dust contains propylene glycol monomethyl ether, and possibly other irritants. Dust should be controlled by vacuuming of envelopes and by housekeeping, and room ventilation should be increased as outlined in section VIII of this report.

Keywords: SIC 4931, indoor air pollution, glycol ethers, propylene glycol monomethyl ether, mucous membrane irritation.

II. INTRODUCTION

In April, 1983, the National Institute for Occupational Safety and Health received a request for a Health Hazard Evaluation at the Public Service Electric and Gas Corporation's Customer Payment Processing facility in Iselin, New Jersey. The request was submitted by the president of the Utility Co-Workers' Association, Bloomfield, New Jersey, on behalf of the workers at the facility, and the HHE was assigned to the New Jersey State Department of Health, Occupational Health Program, under a Cooperative Agreement, in June, 1983.

In its HHE request, the union reported worker complaints of burning, itching, and redness of hands, hives, and irritation following the installation of an AES MAILSYSTEM 3-30 automatic envelope opening machine. Also, the union asked for evaluation of exposure to Paper Fiber Separation Solution, used in the AES 3-30. This is the first report of this evaluation.

III. BACKGROUND

The Public Service Electric and Gas Company (PSE & G) of New Jersey operates its Customer Payment Processing Center in Iselin, N.J. The Center receives and processes its customers' bill payments for this large public utility. PSE&G rents space for the facility in an office building.

The facility has three rooms: a mail room, a large working room where most of the employees work, and the manager's office, which also is a conference room. In July, 1983, there were 40 employees; also working there were three employees of AES Technologies Systems, Inc., and one employee of General Instruments (GIC) Corporation, a computer supplier.

In December, 1981, PSE&G leased and began to use an AES MAILSYSTEM 3/30 automatic envelope opening machine in order to increase productivity at the facility. The machine opens up to 30,000 envelopes per hour by chemically separating the paper fibers at the envelope edges. It does so by spraying three edges of each envelope with Paper Fiber Separator solution (PFS), then heating the envelope on a hot plate. The paper at the edges comes apart and the envelopes are sent to the 25 to 30 payment processors, who remove payments and bills from the opened envelopes and process them. Dust is produced by the decomposition of the paper; most of it is captured by vacuum cleaners inside the machine. The AES 3/30 also has exhaust ventilation, vented to the outside. In July, 1983, the facility processed an average of about 50,000 envelopes daily.

Soon after the machine was installed, payment processors began to complain of burning and itching of their skin and of irritated eyes, to their union, the Utility Co-Workers Association. In April, 1982, management queried employees, and sent two employees to doctors, one complaining of eye irritation and the other of skin irritation.

According to the union, the complaints continued and, on October 29, 1982, the union requested an OSHA investigation. In its request the union stated that the AES employees working directly with PFS had experienced burning, itching, and redness of the hands. Payment processors reportedly complained of similar symptoms, including hives and eye irritation. OSHA investigated these complaints on November 5, 1982. AES provided its formulation of PFS solution, which included distilled water, propylene glycol monomethyl ether (also known as 1-methoxy -2-propanol, or 1-MP), tartaric acid, Zonyl F.S.P. (a trade name for a fluoroalkyl phosphate surfactant) and calcozine phodamine (a red dye). The OSHA

investigator was also provided with an April, 1979 report by Walter C. McCrone Associates, Inc., a private laboratory. McCrone Associates analyzed the vapor from envelopes opened using PFS, and reported that it contained 1-MP, a mixture of aldehydes (including formaldehyde, acetaldehyde, propanal and valeraldehyde) acetone, furfural, and either a pentose or hexose. OSHA tested for aldehydes and volatile organics, and reported "none detected". The inspector did note brownish dust, apparently of decomposed paper, on surfaces in the workplace. The inspector interviewed 7 employees, noted that one had dermatitis, and that others had had past complaints of an episodic nature. He also found that the AES employees had no complaints, and little direct exposure to PFS. OSHA observed no violations of any of its standards on this visit.

OSHA returned on March 22, 1983, at the request of the union, which again reported itching and irritation of the skin and eyes among payment processors. The inspector sampled at the AES machine, and over trays with finished envelopes, for formaldehyde and acetone and found "none detected". Brown dust again was noted on surfaces in the workplace. OSHA again observed no violations of its standards. The inspector mentioned that a NIOSH Health Hazard Evaluation was an available option to analyze the health complaints.

IV. METHOD AND MATERIALS

To determine if there were exposures or health effects related to the AES 3-30, NIOSH conducted an opening meeting and walkthrough, performed medical interviews of workers at PSE&G, and obtained samples for laboratory analysis of PFS and of envelopes opened by the AES 3-30.

A. Environmental

On January 8, 1984, three envelopes opened that day by the AES 3-30 were obtained and sent to the New Jersey State Health Department Laboratory. A sample of PFS was also submitted. All samples were analyzed for propylene glycol monomethyl ether (1-MP), furfural, aldehydes, and acetone, since these entitles were reported by McCrone Associates to be evolved from treated envelopes, and since they are known irritants. Because there was little handling of PFS, and because the AES 3/30 was enclosed and vented to the outside, air sampling was not done.

B. Medical

During the walkthrough investigation on July 8, 1983, 7 payment processors, and one clerical worker who worked near the payment processing area, were interviewed. All had one or more irritative complaints that they related to the workplace.

On July 20, 1983, symptoms possibly related to exposure to vapor or dust emanating from the machine or envelopes were elicited by questionnaire from all 45 employees present in the office. The physician-administered questionnaire (Appendix A) was designed to determine the prevalence of irritant symptoms relating to the skin (skin rash, skin redness), mucous membranes (eye and nasal irritation, sore throat), and lungs (cough, shortness of breath, wheezing, production of phlegm) as well as headache, a possible result of vapor exposure. Information obtained for each symptom included whether the symptom occurred at home, work, or both, frequency of symptom, and date of onset of symptom. A positive (potentially machine

related) response was defined as a symptom which occurred at work only, at least once per week, with onset after 12/81, the time of machine installation. Symptoms occurring both at work and at home or at home only were excluded in order to be as specific as possible. Symptoms which began at work and lasted several hours past the end of the shift were included, however.

For purposes of analysis, respondents were divided into four employee groups: payment processors, who spent their entire day handling envelopes; clerical personnel, with minimal envelope contact; AES-GIC workers, who worked next to the machine and transferred the envelopes to the payment processors; and management, with virtually no envelope or machine contact. Proximity to the machine also was considered: AES-GIC workers were in the mail room and closest to the AES 3/30; payment processors worked in the rear of the main room, next-nearest to the machine; clerical personnel were further away, and management was furthest away, in the front of the main room or in the manager's office.

Analysis consisted of comparison of the prevalence and extent of symptoms among the various groups to determine whether those involved in envelope handling or in closest proximity to the machine were more symptomatic than other employees. Neither age, sex, nor ethnic background was considered relevant to the analysis. While ambient cigarette smoke could conceivably be associated with many of the symptoms, the large open workspace made it impossible to consider this in the analysis.

V. EVALUATION CRITERIA

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

controllong exposures in various industries where the agents are used; the NIOSH-recommended standards, by contrast, are based primarily 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-weighed 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 exposure.

In its investigation of the PSE&G facility, OSHA applied its standards certain airborne chemicals, and found no detectable aldehydes or volatile organics. We have evaluated PSE&G differently, according to symptoms reported by employees, and according to the published toxicity of chemicals that may be evolved from treated envelopes. Where available, however, published criteria are noted here.

Propylene glycol monomethylether - or 1- methoxy -2-propanol (1-MP), is a glycol ether solvent with wide industrial use. It can enter the body through inhalation or by skin contact. Its vapors are of low acute toxicity and the hazard from inhalation is also considered to be low, because high levels are so irritating to the eyes and mucous membranes that humans do not tolerate such exposures (4,5). Levels above 100 ppm are reported to be objectionable because of odor and because of eye, nose, and throat irritation(5); at higher levels there is central nervous system depression (6). Other glycol ethers have been found to cause adverse reproductive effects at levels at or below OSHA standards, in laboratory animals (3). Present information is insufficient to fully assess the potential for adverse reproductive effects in humans of 1-MP, according to NIOSH (3); one study showed delayed skull ossification in rats and mice at high doses (8). The ACGIH TLV as an 8-hour TWA is 100 ppm (9). There are no OSHA-standards or NIOSH -recommended standards.

Aldehydes (formaldehyde, acetaldehyde, propanal, and valeraldehyde) - are strong skin and mucous membrane irritants. Their odor thresholds are low; moderate doses can cause irritative damage to the skin, eyes and respiratory system. High doses may cause toxic pulmonary edema. Aldehydes are also sensitizers, and allergic dermatitis and occupational asthma may occur (10). Formaldehyde is a suspect carcinogen. Therefore, NIOSH recommends occupational exposure to formaldehyde be reduced to the lowest feasible limit. The ACGIH TLVs are 2 ppm for formaldehyde (ceiling limit), 100 ppm for acetaldehyde, and 50 ppm for valeraldehyde; there is none for propanal (9). OSHA standards are 3 ppm for formaldehyde and 200 ppm for acetaldehyde; there are no OSHA standards for propanal or valeraldehyde. The NIOSH proposed standard is 1 ppm for formaldehyde.

Furfural - is a cyclic aldehyde that can affect the body through inhalation, ingestion, or skin or eye contact. It is a strong skin and mucous membrane irritant, and in higher doses can cause pulmonary edema, central nervous system injury, and death (2). It is also a skin sensitizer, causing contact dermatitis in those with prior exposure (1). The ACGIH TLV is 2 ppm; the OSHA standard is 5 ppm, with skin denotation. (This designation indicates that it is readily absorbed through the skin.)

Acetone - is a ketone of relatively low toxicity. Ketones are all solvents which can enter the body by inhalation or skin contact. They are moderate mucous membrane irritants, causing central nervous system depression at higher doses. Contact dermatitis of the skin may occur because of acetone's defatting action. The ACGIH TLV is 750 ppm; the current OSHA standard is 1000 ppm, and the NIOSH - recommended standard is 250 ppm.

VI. RESULTS

Medical

All 45 employees present at work on the day of the evaluation participated in the study. This included 28 payment processors, seven clerical workers, four AES-GIC, and six managers.

The number of positive responders for each symptom is presented in Table 1. These results indicate that symptoms of skin and mucous membrane irritation (sore throat, eye and nasal irritation, skin redness, and skin rash) were more prevalent among payment processors and, to a lesser extent, among clerical workers than among the other employees. Headache was also most prevalent among payment processors. Among these symptoms, nasal irritation was reported by 15 (53.6%) payment processors, 3(42.9%) clerical workers; 1 (25%) AES-GIC worker and none (0%) of management; skin redness was reported by 11 (39.3%) payment processors 1 (14.3%) clerical worker and none (0%) of both AES-GIC and management; eye irritation was reported by 10 (35.F%) payment processors, 2 (28.6%) clerical workers, 1 (25%) AES-GIC, and none (0%) of management; headache was reported by 6 (21.4%) payment processors, 1 (14.3%) clerical worker, and none (0%) of AES-GIC or management. Lung symptoms (cough, wheezing, shortness of breath, phlegm) were not prevalent among any employee group.

To further investigate whether the skin and mucous membrane irritant symptoms were concentrated in certain employee groups, data were analyzed according to number of positive responses. The results, presented in Table 2, indicate the payment processors had the greatest proportion of symptomatic individuals (those with one or more symptoms), with 75%, as compared to clerical workers (57%), AES-GIC (25%) and managers (0%) (Chi-square comparing payment processors with all others combined: $X^2 = 7.24$; $p=0.0071$). The payment processors also had the highest average number of symptoms per employee, 1.71, versus 1.14 for clerical workers, 0.5 for AES-GIC, and 0 for managers. The highest number of symptoms was 4, in two payment processors, while 19 employees, in all groups, had 0 symptoms.

Environmental

The AES Solvent contained 18.2% propylene glycol monomethyl ether; aldehydes, furfural, and acetone all were reported as none detected. The three envelopes contained an average of 82.3 mg/kg of propylene glycol monomethyl ether (individual envelopes were reported as 106 mg/kg, 79.1 mg/kg, and 61.8 mg/kg. Aldehydes, furfural, and acetone were reported as none detected. A control envelope was analyzed; all components were none detected. The lower limits of detection for chemicals on the envelopes were as follows: for 1-MP, 61 mg/kg; for acetaldehyde, 90 mg/kg; for furfural, 70mg/kg; for acetone, 70mg/kg.

The edges of the envelopes were noted to be changed from white to brown by the opening process. Light brown dust, similar to that inside the AES 3-30, was observed on surfaces in payment processing.

Both management and employees reported that the facility's ventilation system seemed to have been inadequate. Employees said that air movement was minimal at times, that the office seemed "stuffy", and that air movement and heating seemed uneven. At such times, symptoms may have been increased.

VII. DISCUSSION AND CONCLUSIONS

Based on the results of the environmental and medical evaluations at the PSE&G Customer Payment Processing facility in Iselin, N.J., NIOSH has concluded that there was a substantial number of irritative complaints among employees in that facility, primarily among payment processors. The skin and mucous membrane irritation is concentrated among those who have the greatest opportunity for prolonged exposure to envelopes opened by the AES 3-30 MAILSYSTEM machine, and to the dust from those envelopes. The symptoms were temporally related to the installation of that machine in this facility, which strongly suggests a cause and effect relationship between exposure and symptoms.

Because the AES 3-30 is enclosed and vented to the outside, and because there was little evident opportunity for significant employee exposure to vapors from PFS, air sampling was not done. Instead, analysis of processed envelopes revealed substantial amounts of 1-MP, a known irritant, and dust from such envelopes probably had similar amounts of 1-MP. While aldehydes, furfural, and acetone were reported as none detected, the detections limits were high, since analysis of envelopes is difficult. Thus, traces of these irritants may also have existed, as they did in the analysis done by McCrone Associates.

The number of employees in each group was small. Therefore, the only statistical test done was to compare the number of payment processors with symptoms, with the number of employees with symptoms in all other groups. Because of small numbers, rates were not adjusted for smoking status or demographic factors. It was not determined if complaints were caused by direct envelope contact, dust, another factor, or a combination of factors. Dust can be a mild irritant to skin and mucous membranes. Finally, if ventilation is not adequate in indoor environments, workers often complain of irritant symptoms, as well as constitutional symptoms such as headaches, fatigue, and poor concentration.

In summary, clinical and epidemiological evidence at PSE&G indicate an association between installation of the AES 3-30, and skin and mucous membrane irritation and headaches in certain employees, primarily among payment processors. This may be caused by residual chemicals including 1-MP on treated envelopes or in dust, or both. Reduction of direct employee contact to envelopes and dust is indicated. Proper general ventilation would lessen the reported stuffiness of this workplace.

VIII. RECOMMENDATIONS

1. Trays of envelopes should be vacuum cleaned prior to transfer to the payment processors. This has already begun, at NJSDH's verbal suggestion.

2. Because the reported symptoms may be aggravated by the contaminants present in cigarette smoke, smoking should be confined to non-work areas such as the break room.

3. The general ventilation system should be evaluated by a ventilation engineer to assure that the system conforms to ASHRAE standards. (see appendix)

4. Scrupulous housekeeping should be done daily, including dusting and vacuuming, to remove residual dust.

5. Once these suggestions have been implemented, the presence of continued symptoms should be ascertained. If symptoms do continue, the AES 3-30 should be re-engineered to reduce residual chemicals on envelopes.

RESULTS TABLE I

POSITIVE RESPONDERS* FOR EACH SYMPTOM AMONG FOUR EMPLOYEE GROUPS

Symptom	D Payment Processors (28 Total)	C Clerical Workers (7 Total)	B AES-GIC (4 Total)	A Management (6 Total)
Sore Throat	3 (10.7%)	2 (28.6%)	0 (0%)	0 (0%)
Eye Irritation	10 (35.7%)	2 (28.6%)	1 (25%)	0 (0%)
Nasal Irritation	15 (53.6%)	3 (42.9%)	1 (25%)	0 (0%)
Skin Redness	11 (39.3%)	1 (14.3%)	0 (0%)	0 (0%)
Skin Rash	5 (17.9%)	0 (0%)	0 (0%)	0 (0%)
Cough	1 (3.6%)	0 (0%)	1 (25%)	0 (0%)
Wheezing	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Shortness of Breath	0 (0%)	1 (14.3%)	0 (0%)	0 (0%)
Phlegm	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Headache	6 (21.4%)	1 (14.3%)	0 (0%)	0 (0%)

* Positive Response = Symptoms occurring at least weekly, at work only, onset after 12/81.

RESULTS-TABLE 2

EXTENT OF SKIN AND MUCOUS MEMBRANE SYMPTOMATOLOGY*
WITH FOUR EMPLOYEE GROUPS

#of Employees with Each Number of Symptoms

Number of Symptoms	Payment Processors	Clerical Workers	AES-GIC	Management
0	7 (25.0%)	3 (42.9%)	3 (75%)	6 (100%)
1	6 (21.4%)	2 (28.6%)	-	-
2	5 (17.9%)	-	1 (25%)	-
3	8 (28.6%)	2 (28.6%)	-	-
4	2 (7.1%)	-	-	-
5	-	-	-	-
TOTAL	28 (100%)	7 (100%)	4 (100%)	6 (100%)
No. employees with 1 or more symptoms	21 (75%)	4 (57%)	1 (25%)	0 (0%)
Avg. # of symptoms per employee	1.71	1.41	0.50	0

* Symptoms include eyes and nasal irritation, sore throat, skin redness and skin rash.

** Chi-square comparing payment processors with all others, combined: $X^2=7.24$; p=0.0071

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XI. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this 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, 22161.

Copies of this report have been sent to:

1. Utility Co-Workers' Association, Bloomfield, New Jersey
2. Public Service Electric and Gas Corporation, Iselin, New Jersey
3. Region II, NIOSH
4. OSHA, Region II
5. AES Technologies, Inc., Elk Grove Village, Ill.

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

APPENDIX A

MEDICAL QUESTIONAIRE FORMS

Are you bothered by any of the following? Yes ____ No ____

If yes, to any of the below symptoms, how frequently?

Code: 1 = Seldom
2 = Monthly
3 = Weekly
4 = Daily

	At Work	Yes Other Times	Date of Onset (Mo./yr.)	Frequency of Symptoms At Work	Other Times	Seen By Physicians Yes
Eye irritation (itchy, red or watery eyes)	___	___	_____	_____	_____	_____
Nasal irritation (sneezing, runny nose or stuffiness)	___	___	_____	_____	_____	_____
Skin rash	___	___	_____	_____	_____	_____
Skin irritation (redness)	___	___	_____	_____	_____	_____
Cough	___	___	_____	_____	_____	_____
Wheezing	___	___	_____	_____	_____	_____
Chest tightness	___	___	_____	_____	_____	_____
Shortness of breath with exertion	___	___	_____	_____	_____	_____
Bring up phlegm (sputum)	___	___	_____	_____	_____	_____
Sore throat	___	___	_____	_____	_____	_____
Headache	___	___	_____	_____	_____	_____
Other problems, lung or respiratory	___	___	_____	_____	_____	_____

Describe: _____

_____

Have you been told by a physician that you have a medical problem? Yes ____ No ____

If yes, indicate and diagnosis

_____

_____

_____

_____

Do you now smoke cigarettes? (as of 1 month ago) Yes ___ No ___

If yes, how many on the average, daily? (1 pack = 20) _____

State of New Jersey
DEPARTMENT OF HEALTH
JOHN FITCH PLAZA
CN 360, TRENTON, N.J. 08625

J. RICHARD GOLDSTEIN, M.D.
COMMISSIONER

CONSENT FORM

I have been informed that the New Jersey State Department of Health is conducting a study of environmental factors and their effect of the health of individuals. This study involves obtaining information from me about my residence, and health, as well as some information about other substances I may have been exposed to. The interview will require approximately 15 minutes of my time. I understand it may be necessary to contact me again.

I have agreed to take part in this study and to give information to the interviewer understanding that:

1. My response will be kept completely confidential

2. My participation is voluntary and I am free to discontinue participation at any time.

3. The information in this study will be summarized by New Jersey State Department of Health to determine whether environmental factors in this area may be contributing to health problems.

NAME (print)_____

PARTICIPANT SIGNATURE_____

DATE: _____

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL
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