U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 74-89-189

NEW YORK TELEPHONE & TELEGRAPH COMPANY
42nd Street and 7th Avenue
New York, New York

APRIL 1975

I TOXICITY DETERMINATION

It has been determined that air concentration levels were below the detectable limit for vinyl chloride, styrene, benzene and hydrogen chloride and therefore are judged to be not toxic under the conditions noted during the evaluation. This evaluation was conducted on October 21, 1974 and the determination is based on air sampling, personal observation, and personal correspondence with manufacturer of heat shrinkable tape being used.

I DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this hazard evaluation determination are available upon request from the Hazard Evaluation Service Branch, NIOSH, Cincinnati, Ohio 45202.

Copies have been sent to:

a) New York Telephone and Telegraph Company
b) Authorized Representative of the Employees
c) U. S. Department of Labor - Region II
d) NIOSH - Region II
e) NIOSH - Region III

For the purpose of informing approximately 17 employees, this report shall be posted in a prominent place readily accessible to workers for a period of at least 30 days.

I INTRODUCTION

Section 20(a) (6) of the Occupational Safety and Health Act of 1970, 29 U. S. Code 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.

The National Institute for Occupational Safety and Health received such a request from an authorized representative of the employees of New York Telephone and Telegraph Company to evaluate the potential hazard of vinyl chloride gas at the splicing operation when heat shrinkable tape ("Amphiseal Type II") was being used.

IV HEALTH HAZARD EVALUATION

A. Plant Process - Conditions of Use

This company provides telephone service to the New York metropolitan area. Periodic installation of new and replacement cables calls for splicing lengths of cables. Upon completion of the splice a protective coating must be applied. One such method of coating the splice, of special concern to the union due to the possible presence of vinyl chloride (VC), requires that a sleeve polyvinyl chloride (PVC) be place over the splice and wrapping with a heat shrinkable tape. The wrapping is then slowly heated by passing a hand held heater over the wrapping until the adhesive backing appears along seams formed by the edges of over lapping layers of tape. This wrapping procedure is repeated until three layers have been applied which completes the coating. Initially heat shrinkable tape was reported to contain PVC but later communications with the manufacture indicated the tape was an ionomer resin of the polyolifin family and contained no chloride compounds.

Operational temperatures vary due to the speed at which the heater is passed over the coating and approximate distance from the coating. The fixed temperature output of the heater is 500°F however, the temperature on the surface of the coating is more in the range of 150° to 200°F. The entire coating operation lasts about 60 minutes from start to finish. The frequency of coating varies, but is rarely performed more than twice a week.

B. Evaluation Design

An initial survey at New York Telephone and Telegraph Company was conducted by Wesley E. Straub, NIOSH, Region III, Industrial Hygienist on October 21, 1974. Subsequently conversations were held with the product manufacturer regarding the composition of the heat shrinkable tape.

C. Evaluation Methods

Employee exposures to vinyl chloride were evaluated during the initial survey using personal air sampling equipment. Air samples were collected utilizing activated charcoal and analyzed for vinyl chloride and styrene by gas chromatography.[1] The limit of sensitivity for the chromatographic technique used in this study is 0.2 parts per million parts of air (ppm) for vinyl chloride and 5 ppm for styrene. Mine Safety Appliance Company and Dragerwerk Lubeck direct reading detector tubes were used to sample for benzene and hydrogen chloride respectively to evaluate potential-

IV HEALTH HAZARD EVALUATION

C. Evaluation Methods

decomposition products of PVC. The limit of sensitivity for the benzene detector tube is approximately 15 ppm while the hydrogen chloride detector tube is approximately 1.0 ppm.

D. Evaluation Criteria

The occupational health standards pertaining to this evaluation based on the most recent and relevant information are as follows:

Recommended Threshold Limit Values

Substance	TWA (a) ppm	STEL (b) ppm
Vinyl chloride	Limit of detectibility[1]	5[2]
Benzene	10[3]	25[3]
Hydrogen chloride	-	5[4]
Styrene	100[4]	

1. Limit of detection for recommended method is approximately 0.2 ppm. Recommended Standard for Occupational Exposure to Vinyl Chloride - NIOSH, March 11, 1974.

2. Established by OSHA, Chapter XVII, Part 1910, published in Federal Register, Vol. 39, No. 194, Oct. 4, 1974, Page 35890.

3. Criteria for a Recommended Standard - Occupational Exposure to Benzene - NIOSH, 1974.

4. Documentation of the Threshold Limit Values for Substances in Workroom Air. 3rd edition, ACGIH, 1971.

a. TWA - Time Weighted Average for an 8-hour day exposure.

b. STEL - Short Time Exposure Limit - for up to 10 minutes or instantaneously.

E. Evaluation Results and Discussion

Direct reading samples collected at the time of the initial survey indicated no detectable level of hydrogen chloride or benzene. Samples analyzed for styrene also indicated no detectable level present. A response was detected when samples were at the lower sensitivity limit of the gas chromatograph method (0.2 ppm) Correspondence with the manufacture[2] of the heat shrinkable tape indicated that no chloride is present in the materials used to manufacture Amphiseal Type II tape. This then eliminates the probability that the analytical response noted be attributed to the presence of vinyl chloride.

Personal correspondance further indicated that no volatilization of the tape would be anticipated at temperatures employeed at this operation. Thus with present technology, the absence of any detectable contaminant, limited exposure time and the anticipated absence of any volatilization of the tape when heated, no exposure, can be expected that would result in a toxic effect upon employees.
In view of this no recommendations are made.

V REFERENCE

1. NIOSH, Manual of Analytical Methods P&CAM #178 and #127, HEW Publication No. (NIOSH) 75-121

2. Personal correspondence: J. Lathrope, AMP Corporation, Harrisburg, Penna.

VI AUTHORSHIP AND ACKNOWLEDGMENT

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TABLE I

AIR CONCENTRATIONS
NEW YORK TELEPHONE AND TELEGRAPH
NEW YORK, NEW YORK

REPORT NO. 74-89

October 21, 1974

Location	Operation	Sample Minutes	Concentration/ppm (1) Vinyl Chloride (2)	Benzene (3)	Hydrogen Chloride (4)	Remarks	Exposure time
Avenue of America's vault	Cable Splicing	15	N.D. (5)			All concentrations represent operator exposure	Maximum of 1 3/4 hrs. per wk.
		15	N.D.				
		15	N.D.				
		15		N.D.		All concentrations represent operator exposure	Maximum of 1 3/4 hrs. per wk.
		15		N.D.			
		15		N.D.			
		15			N.D.	All concentrations represent operator exposure	Maximum of 1 3/4 hrs. per wk.
		15			N.D.		
		15			N.D.		

1) ppm - parts of vapor or gas per million parts of air
2) Threshold Limit Value based on a Time Weighted Average for an 8 hour day/limit of detection or approximately 0.2 ppm
3) Threshold Limit Value based on a Time Weighed Average for an 8 hour day 10 ppm
4) Short term limit value for up to 10 minutes 5 ppm
5) Denotes none detected.