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

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 73-111-125

SOUTHERN STEEL AND WIRE COMPANY
3501 SOUTH TULSA STREET
FORT SMITH, ARKANSAS
MARCH 1974

I. TOXICITY DETERMINATION

Based on data collected by NIOSH personnel on August 24, 1973, it was determined that emissions from the acid tanks and welding operations in the plating department, automatic line, are not toxic to employees at the concentrations used and found during the evaluation. This determination was based on (1) interviews conducted with various employees, and (2) results of environmental sampling conducted around the automatic plating line.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report are available upon request from the Hazard Evaluation Services Branch, NIOSH, U.S. Post Office Building, Room 508, 5th and Walnut Streets, Cincinnati, Ohio 45202. Copies have been sent to:

a) Southern Steel and Wire Company, Fort Smith, Arkansas
b) Authorized Representative of Employees
c) U.S. Department of Labor - Region VI
d) NIOSH - Region VI

For purposes of informing the affected employees, the employer will promptly "post" the Determination Report in a prominent place(s) near where affected employees work for a period of thirty (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), authorized the Secretary of Health, Education, and Welfare, following a written request by an 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 (NIOSH) received such a request from an authorized representative of employees to evaluate the potential hazards associated with the alleged exposure to emissions from acid tanks and welding operations in and around the automatic line of the plating department.

IV. HEALTH HAZARD EVALUATION

A. Conditions of Use

The Southern Steel and Wire Company produces refrigerator shelves and baskets. Production is dependent upon the surface area of the piece that is being produced. The Health Hazard Evaluation Request concerned operations around the plating department's automatic line which is located in the main building. This process consists of an automatic plating line with facilities for alkaline cleaning, acid dip, electro-cleaning, zinc plating, and chromate dip. Rinse waters contain chromates as well as sodium cyanide.

B. Worksite Evaluation

On August 23, 1973, Mr. Harry L. Markel, Jr., met with Union and management representatives of the Southern Steel and Wire Company. After the initial interview, a walk-through survey was performed of the alleged hazard area. It was observed that only one employee now works in the immediate area of the automatic plating line - the "machine watcher" - who maintains two positions on the catwalk around the plating tanks. Approximately 10-12 persons are employed in the general area (rack loading/unloading and resistance welding) surrounding the plating operation. Because of the relatively small number of individuals employed in the area, it was decided to conduct appropriate environmental sampling on August 24th to assist in evaluating the extent of exposure.

C. Evaluation Design

Employee interviews and environmental sampling were conducted on August 23-24, 1973. Area samples were collected around the plating line and limited breathing zone samples taken of the "machine watcher."

D. Evaluation Methods

1. Chromates

General area samples were measured with personal air sampling equipment and AAWP Millipore, 0.8 μ poresize, 37mm filters mounted in three-piece cassettes. A colorimetric method of analysis was used to determine hexavalent chromium.

2. Cyanide

Employee exposure to cyanide concentrations in the work area was evaluated using personal air sampling equipment and midget impingers containing 0.1 N sodium hydroxide. The analysis method used was ion specific electrode (colorimetric).

3. Hydrochloric Acid

Employee exposure to HCL concentrations in the work area was evaluated by use of personal air sampling equipment and midget impingers containing 0.01 N sodium hydroxide. Samples were analyzed turbidimetrically using silver nitrate.

4. Employee Interviews

A non-directed medical questionnaire was completed for the "machine watchers". Interviews were likewise conducted with twelve (12) other workers in the area surrounding the plating operation.

E. Evaluation Results and Discussions

1. Environmental Sampling

Twenty-six (26) air samples were collected during normal plating operations. Of these, one (1) was a measure of the "machine watcher" exposure to hydrochloric acid; nine (9) were for general area concentrations of hydrochloric acid; nine (9) were for general area concentrations of chromates; and seven (7) were for general area concentrations of cyanide.

As indicated in the following table, only small amounts of these materials were evidenced:

RESULTS OF ENVIRONMENTAL SAMPLING

Substance Evaluated	No. of Samples	(a) Concentration (mg/M^3) Min.	Ave.	Max.	(a) Applicable Std. (mg/M^3)
Hydrochloric Acid	10	$\leq$ 0.35	$\leq$0.35	$\leq$0.35	7 (ceiling)
Chromates	9	$\leq$ 0.007	0.007	0.015	0.1 (8-hr. TWA)
Cyanide	7	$\leq$ 0.01	0.03	0.08	5 (8-hr. TWA)

(a) mg/M^3 = milligrams of substance per cubic meter of air sampled.

2. Employee Interviews

Discussions with two (2) employees (present and past) who worked on the automatic plating line failed to reveal any complaints, relative to respiratory, eye or nasal irritation problems.

Twelve (12) other employees in the general work area were interviewed and stated that they, at one time or another, have had respiratory problems, burning of the nasal tissues and/or discomfort of the eyes. However, it was mentioned that these conditions have improved since the general ventilation has been modified during the past eight months by the installation of: (a) windows on the extreme east side of the building,

and (b) a 22,000 CFM ceiling exhaust fan south of the plating operation. However, smoke tube evaluations revealed that the area immediately west of the plating line is relatively "dead" as far as ventilation is concerned.

F. Recommendations

Recommendations, based on observations/evaluations made during the visit and presented during the exit interview were as follows:

(1) Installation of an additional ceiling exhaust fan in the area west of the automatic plating line to improve ventilation.
(2) Improved maintenance of slot ventilation ducts on existing tanks in the plating area to prevent possible clogging.
(3) General precautionary measures to be followed in the handling and/or storage of hazardous chemicals currently being used.

V. AUTHORSHIP AND ACKNOWLEDGMENT

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