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. 76-26-320

ADOLPH COORS COMPANY
BREWERY WAREHOUSE
(Battery Charging Area)

AUGUST, 1976

I. TOXICITY DETERMINATION

It has been determined that employees in the battery charging area, warehouse department, Adolph Coors Company (Brewery) were not exposed to toxic concentrations of sulferic acid during NIOSH investigation. However, medical questionnaires indicate that employees in this area had experienced transient episodes of irritation of the eyes, nose, and throat, particularly during the "week-end charge" of batteries.

This determination is based on environmental/medical evaluations conducted March 8-9, 1976 and June 28-29, 1976.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report are available upon request from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. Copies have been sent to:

a) Adolph Coors Company (Brewery)
   Golden, Colorado
b) Authorized Representative of Employees
c) U.S. Department of Labor - Region VII
d) NIOSH - Region VIII

For the purpose of informing the approximate 9 "affected" employees, the employer shall promptly "post" the Determination Report for a period of 30 calander days in a prominent place near where exposed employees work.

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 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 the Brewery Bottling, Can and Allied Industrial Union, Local #366, AFL-CIO workers regarding employee's exposure to "Toxic fumes" and "Safety hazards" in the Battery Charging Area. This request was prompted by employees' allegedly experiencing irritation of the eye, nose and throat, nausea and vomiting, from battery "fumes", during charging, and having to work with the threat of an explosion from welding and charging batteries in the same area.

IV. HEALTH HAZARD EVALUATION

A. Plant Process - Conditions of Use

Adolph Coors Company (Brewery) employs approximately 2800 employees at this plant. Only 9 employees are involved in the battery charging area; three per shift.

Battery charging stations are laid out in twelve rows, varying slightly in the number of charging stations per row.

A maximum of 65 batteries may be charge at one time. These batteries (24, 36, and 48 volts) are used to power fork lifts which in turn are used to load beer onto trucks.

During the first plant visit, Battery charging rows 1-3, and 9-12 were locally exhausted; rows 4-8 were not. Prior to the second visit, the exhaust system for rows 1-3 was extended to include rows 4-8. The distance between the local exhaust and the top of the battery is either 6 inches or 18 inches. The slot opening is 3 inches x 24 inches in all cases. In addition to the local exhaust systems, air was exhausted through one wall fan located near the ceiling and above battery charging row 1. Air is also exhausted by a wall fan and one local exhaust, both located in the repair area. This area was located across the isle from the Battery charging area.

Make-up air is supplied through three large doorways which lead to the warehouse, Four air circulation fans (5 feet above the floor) were use to aid in moving the make-up air toward the exhaust points.

Prior to our initial visit the infrequent practice of welding in the battery charging area had been discontinued. From that time on, welding is conducted in the repair area and no closer than 20 feet from the charging area.

Battery repair, which involved the use of an oxyacetylene torch was conducted intermittently in the immediate Battery charging area. This practice was also moved to the repair area and conducted in the presence of a local exhaust at our (NIOSH) recommendation; this was done immediately after the initial survey.

B. Evaluation Progress

The request for a Health Hazard Evaluation was received on February 6, 1976 and assigned to the project officer on February 24, 1976. An Initial Environmental/medical evaluation was conducted on March 8-9, 1976. During this initial visit employees alleged that environmental air conditions were worse during the warm summer months. The reason for this was stated to be that more beer is produced during hot weather which inturn requires more use of the fork lift trucks and as a result more battery charging. For this reason completion of the evaluation was delayed 3 months and a follow-up visit was conducted on June 28-29, 1976.

C. Evaluation Methods

1. Environmental

Environmental air samples were collected on cellulose membrane filters at 2 liters per minute. Both personal breathing zone and area samples were collected during both the initial and the follow-up survey.

Analysis of these samples was a titration method.

In addition to sampling, air velocities of the local exhaust system were made during both surveys. The reason for this was that additional local exhaust had been installed between the first and second survey.

A confidential medical questionnaire was administered to employees in the work area during both evaluations.

D. Evaluation Criteria

1. Environmental

The Federal Standard (OSHA) and the American Conference of Governmental Industrail Hygienists" (ACGIH) Threshold Limit Value (TLV) for sulfuric acid are identical (0.1 mg/m^3 determined as a Time weighted average (TWA) for an 8-hour work day, 40-hour week). The NIOSH Recommended Standard is 0.1mg/m^3 determined as a TWA for up to a 10-hour work day, 40-hour/week. In summary, all are essentially the same and were considered.

2. Physiological Effects of Sulfuric Acid

Sulfuric acid has a great affinity for water and therefore possesses the property of being able to burn and char the skin when contacted in concentrated form. In dilute form its main characteristic is its irritating property to the skin and mucous membranes.

The principal effects of exposure to sulfuric acid mist is the irritant effects on the mucous membranes, including the eyes, but principally the respiratory tract and its corrosive action on teeth!

E. Evaluation Results and Discussions

A total of 33 samples were collected during these two surveys. These samples were collected for approximately eight hours and Sulfuric Acid was not detected on any of the samples; the detection is 0.1 milligrams per sample.

The reason for the second survey was that during the initial, employees indicated that conditions were much worse during hot weather.

During the second survey a thermometer located just out side an emergency exit (which faces the west) and under some steps read 102^{0}F. The thermometer was in the shade of the step but the wall was radiating heat as a result of direct solar load. In brief, this was one of the hotter summer days and sulfuric acid was not detected on any of the samples.

Employees stated batteries are given a "week-end charge" (12-hour charge) every other week and that "fumes" were very irritating at that time. The reason allegedly being that all batteries were being given the "week-end" charge at the same time. A simple solution was subsequently recommended to management: "Week-end charge" a limited number of batteries each 12 hour period, and locate them in different rows. This would reduce any concentration build up which may occur when charging them all at once.

The alleged safety hazard - welding in the battery area was taken care of prior to our initial visit.

The local exhaust was not operating at the initial design figure. The two local exhaust systems were purported to be exhausting 29,000 cubic feet of air per minute (CFM); however, by measuring the air velocity and calculating the air volume it was determined that these two systems exhausted just under 13,000 CFM, together. No air flow measurements of the wall fan (near the ceiling) were made, nor of the two exhaust fans in the repair area. The latter two were purported to exhaust 9,000 CFM (wall fan) and 3,300 CFM (local exhaust for welding.)

The medical questionnaires indicate that employees occasionally experience irritation of the eyes, nose, and throat. Such incidences were reported to occur during the "week-end" charge. Employees also indicated that the symptoms experienced during the "weekend-charge" were more pronounced during hot weather.

Although the local exhaust system above the Battery charging area did not exhaust the amount of air stated in the design figures, there was no evidence to indicate that that amount of air should be increased.

V. REFERENCES

1. NIOSH Criteria for a Recommended Standard...Occupational Exposure to Sulferic Acid, 1974

VI. AUTHORSHIP AND ACKNOWLEDGEMENTS

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