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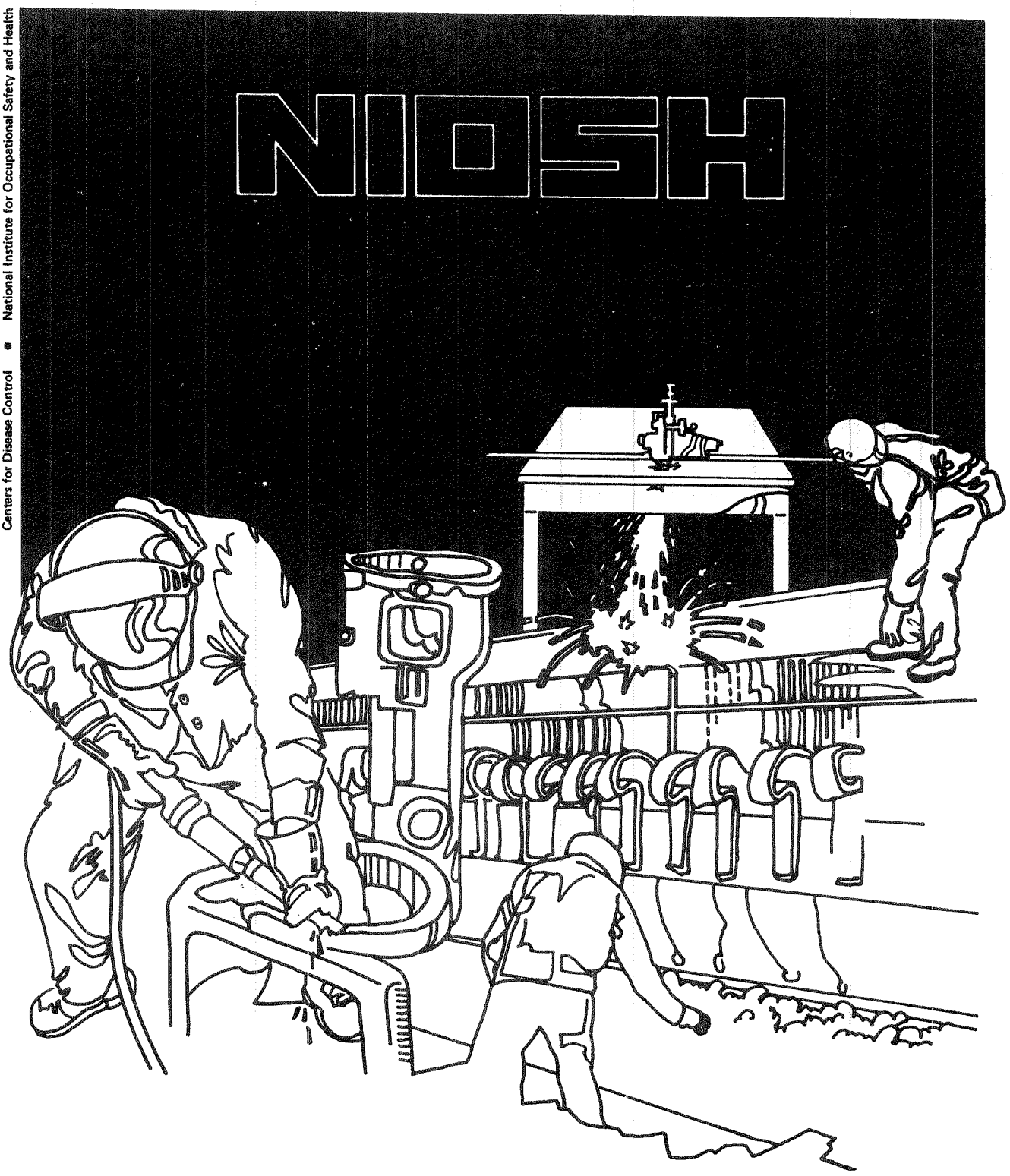

# Health Hazard Evaluation Report

HETA 80-010-1199
CITIES SERVICE COMPANY
BUTYL RUBBER PLANT
LAKE CHARLES, LOUISIANA

## 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 80-010-1199
JANUARY 1983
Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

NIOSH INVESTIGATORS:
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## I. SUMMARY

In October 1979, the National Institute for Occupational Safety and Health (NIOSH) received a request from a local union to evaluate the exposures of approximately 100 butyl rubber plant production employees to various chemicals/contaminants in the copolymerization/dryer areas and the finishing building at Cities Service Company's Lake Charles, Louisiana facility.

From November 13-19, 1980, an environmental evaluation was conducted at the plant. Results of 41 personal breathing-zone air samples were as follows: methyl chloride [9 eight-hour time-weighted-average samples ranging from 3 - 40 milligrams per cubic meter of air sampled ($mg/M^3$); 4 "ceiling" samples ranging from 108 - 647 $mg/M^3$]; nuisance particulate [6 "total" dust air samples ranging from 0.04 - 0.27 $mg/M^3$; 6 "respirable dust air samples ranging from below the lower limit of detection (LOD) of the analytical method to 0.17 $mg/M^3$]; zinc stearate [7 air samples ranging from the LOD to 0.42 $mg/M^3$]; aluminum chloride [7 air samples, all of which were below the LOD]; and hydrogen chloride [2 air samples ranging from 0.4 - 1.4 $mg/M^3$]. With the exception of one methyl chloride "ceiling" sample, all air samples were below the Occupational Safety and Health Administration's (OSHA's) "permissible exposure limits". Two area samples collected in an attempt to identify the components of smoke in the finishing building revealed the presence of the following compounds: perchloroethylene, small amounts of toluene/xylene/benzene, trimethyl benzene, terpenes, alkanes, triisobutylene, and polyisobutylene.

A medical questionnaire survey was conducted among operating unit, pool, maintenance, and packaging unit personnel, the latter group presumably not exposed to methyl chloride. The exposed workers did not differ significantly from the unexposed workers with respect to a variety past and present medical conditions, mood state scores on a psychological questionnaire, or 24 neurological symptoms with one exception: nine of 27 exposed workers reported trouble sleeping, compared to none of 13 unexposed ($p = 0.05$, Fisher's exact test 1-tailed).

At the time of NIOSH's investigation, there was no substantial environmental evidence of a health hazard due to exposure to methyl chloride, nuisance dust, zinc stearate, aluminum chloride, or hydrogen chloride, and the medical survey revealed no health effects attributable to methyl chloride. Recommendations to maintain employee exposure to a minimum may be found in Section VII of this report.

KEYWORDS: SIC 2822 (synthetic Rubber); methyl chloride, aluminum chloride, hydrogen chloride, zinc stearate.

## II. INTRODUCTION

On October 6, 1979, the National Institute for Occupational Safety and Health (NIOSH) received a request from Local 4-500, Oil, Chemical and Atomic Workers Union to evaluate employee exposures to chemicals and smoke in the finishing building, dryer area, and catalyst recharging area at the Cities Service Company's Butyl Rubber Plant, Lake Charles, Louisiana. The rubber plant has been in operation since 1963, employs 99 persons (6 administrative, 76 production, 17 maintenance), and operates on a three-shifts-per-day, seven-days-per-week schedule.

NIOSH investigators performed a walk-through inspection of the plant on June 11, 1980*, conducted environmental studies during the period November 13-19, 1980, and conducted a medical study in December 1980.

## III. EVALUATION DESIGN AND PROCEDURES

### A. Environmental

Based on the walk-through inspection, employee operations in the finishing building, dryer area, and aluminum chloride charging area were identified for environmental monitoring, which was conducted during the period November 13-19, 1980. Personal breathing-zone air samples were collected to evaluate employee exposure to methyl chloride, total/respirable dust (nuisance particulate matter), zinc stearate, aluminum chloride and hydrogen chloride.

Samples were collected by using 0.8 micron pore-size mixed cellulose ester membrane filters, large/small charcoal tubes in series, and silica gel tubes, depending on the prescribed sampling/analytical method. Analytical methods utilized were gas chromatography/flame ionization, gravimetric analysis, atomic absorption spectrophotometry, and ion chromotography.

*As the result of a strike, the plant was not in operation during the earlier part of 1980.

In an attempt to identify the components of the smoke within the finishing building, area air samples were collected from both the expeller deck and the second level of the scale deck by using a sampling train consisting of glass fiber/silver membrane filters, followed by standard charcoal tubes. The glass fiber filters and charcoal tubes were desorbed separately in carbon disulfide and analyzed qualitatively by gas chromatography. Identities of analytes were confirmed by mass spectrometry.

B. Medical

In order to investigate health effects, a cross-sectional medical study was conducted during December 1980. Questionnaires covering occupational history, medical history (with a detailed section on neurological symptoms), demographic information, and information on smoking, drinking, and use of medications, were administered by trained interviewers. In addition, each participant was asked to complete a self-administered Profile of Mood States (POMS) questionnaire. This has served as a useful measure of assessing mood states,[1] which could presumably be affected by chemicals that affect the central nervous system.

Based on results of the previously mentioned walk-through investigation, cross-sectional medical study, POMS questionnaires, and employees interviews, primary emphasis was placed on employee exposure(s) to methyl chloride during this evaluation.

The following employees were invited to participate:

(A) Forty-two operating unit personnel, seven pool personnel, and 17 maintenance personnel, all of whom were potentially exposed to methyl chloride

(B) Twenty-three packaging unit personnel, who were presumably not exposed to methyl chloride

## IV. EVALUATION CRITERIA

### A. Environmental

Environmental standards and criteria applicable to this evaluation are shown below. NIOSH currently has no recommended standards for any of these substances.

| Substance | ACGIH, TLV Committee 8-hr. TWA ($mg/M^3$)* | OSHA, 8-hr. TWA Standard ($mg/M^3$)* |
|---|---|---|
| Methyl chloride | 105.0 | 210.0(a) |
| Nuisance particulate (respirable) | 5.0 | 5.0 |
| Nuisance particulate (total) | 10.0 | 15.0 |
| Zinc stearate | 10.0(b) | (c) |
| Aluminum chloride | 2.0(d) | (c) |
| Hydrogen chloride | 7.0 | 7.0 |

* Eight-hour time-weighted average (TWA) concentrations in milligrams of substance per cubic meter of air sampled

(a) Ceiling: 420 $mg/M^3$
(b) Considered as nuisance particulate
(c) No standard
(d) Considered as soluble aluminum salts

ACGIH - American Conference of Governmental Industrial Hygienists, Threshold Limit Value Committee
OSHA - Occupational Safety and Health Administration

B. Toxic Effects

Methyl Chloride[2,3,4,5]

Methyl chloride is a substantially odorless, colorless gas with moderate flammability. Its odor becomes faintly sweet and ether-like in high concentrations, but is undetectable at levels that are dangerous to breathe. It is slightly corrosive as it will slowly hydrolyze in air, in the presence of moisture, to hydrochloric acid. In strong ultraviolet light, or in contact with open flames or hot surfaces, and in the presence of air and moisture, the compound will decompose with the formation of hydrogen chloride, carbon monoxide, carbon dioxide, and possibly phosgene.

The effects of methyl chloride on the nervous system reflect a profound central nervous system (CNS) depression. The clinical picture is similar to alcoholic intoxication. An increase in toxic signs can be expected for possibly 48 hours. Specific sequelae of symptoms suggestive of CNS damage include staggering gait, nervousness and emotional instability, insomnia and anorexia, dimness of vision, difficulty reading, attacks of vertigo, tremor, weakness and uncoordination of the limbs among others.

Severe acute exposure can result in severe headache, confusion, impaired judgment, extreme drowsiness, slurred speech, occasional bouts of fever, blurred vision, staggering gait, muscle weakness and tremor; if the exposure is severe enough, loss of consciousness, epiliptiform seizures, and possibly death through respiratory collapse may occur. Less severe chronic or subacute exposure produce many of the same symptoms with lessened severity.

Behavioral manifestations of exposure to methyl chloride include emotional changes such as depression, introspectiveness, instability; psychoneurosis and suicide have been reported. Recent data suggest a decrease in speed and accuracy of simple tasks and a dimunition of the ability to time-share in more complex performance or work situations at ambient air concentrations of methyl chloride as low as 70.6 milligrams per cubic meter.

Physiologic effects on kidney or liver are unusual. Gastrointestinal symptoms such as nausea, vomiting, abdominal pain, diarrhea, anorexia, and loss of weight may occur; dysphagia and spells of hiccups have also been mentioned. Reports of hypotension, tachycardia, anemia and mild leucocytosis are infrequent.

Particulate Matter[6]

Nuisance dusts have little adverse effects on lungs and do not produce significant organic disease or toxic effect when exposures are kept under reasonable control. The nuisance dusts have also been called biologically "inert" dusts, but the latter term is inappropriate to the extent that there is no dust which does not evoke some cellular response in the lung when inhaled in sufficient amounts. However, the lung tissue reaction caused by inhalation of nuisance dusts has the following characteristics: the architecture of the air spaces remains intact, scar tissue is not formed to a significant extent, and the tissue reaction is potentially reversible.

Excessive concentrations of nuisance dusts in the workroom air might seriously reduce visibility; cause unpleasant deposits in the eyes, ears, and nasal passages; or cause injury to the skin or mucous membranes by chemical/mechanical action per se, or by the rigorous skin cleansing procedures necessary for their removal.

Hydrogen Chloride[7,8]

Hydrogen chloride is a strong irritant of the eyes, mucous membranes, and skin. The major effects of acute exposure are usually limited to the upper respiratory tract and are sufficiently severe to encourage prompt withdrawal from a contaminated atmosphere. Exposure to the gas immediately causes cough, burning of the throat, and a choking sensation. Effects are usually limited to inflammation and occasionally ulceration of the nose, throat, and larynx. Acute exposures causing significant trauma are usually limited to people who are prevented from escaping; in such cases, laryngeal spasm or pulmonary edema may occur.

Exposure of the skin to a high air concentration of the gas or to a concentrated solution of the gas (hydrochloric acid) will cause burns; repeated or prolonged exposure to dilute solutions may cause dematitis. Erosion of the exposed teeth may occur from repeated or prolonged exposure. Although ingestion is unlikely to occur as an occupational hazard, hydrochloric acid causes severe burns of the mouth, esophagus, and stomach, with consequent pain, nausea, and vomiting.

## V. RESULTS AND DISCUSSION

### A. Environmental

Results appearing in Tables 1, 2, 3 and 4 show that airborne concentrations of nine methyl chloride, 12 particulate matter (six respirable, six total), seven zinc stearate, seven aluminum chloride, and two hydrogen chloride personal breathing-zone air samples were below evaluation criteria.

One of four methyl chloride "ceiling" samples exceeded the applicable OSHA standard. This exposure occured during the dryer shift operation when contamination and/or saturation of the alumina desiccant within the dryer(s) necessitated the exchange of dryers within the system. Actual exposure occurs when the flanges on the unit are loosened/removed, and until the dryer valve is closed off with a swing blind. The operation normally lasts for approximately 15-20 minutes and occurs daily. Because of the short duration, engineering control would not seem feasible; however, appropriate respirators should be required for personnel involved during the dryer shift operation.

Two "area" charcoal tube samples, collected from both the expeller deck and the second level of the scale deck, in an attempt to identify components of smoke within the finishing building, revealed the presence of the following compounds: perchloroethylene and small amounts of toluene/xylene/benzene; an aromatic hydrocarbon such as trimethyl benzene; a terpene; an alkane; an alkene such as triisobutylene; and aliphatics such as olefins from polyisobutylene.

Glass fiber filters used in the same sampling train failed to show any peaks when analyzed by gas chromatography.

### B. Medical

Except for maintenance workers, only half of the eligible workers participated:

| Worker group | Participant | Number eligible | Participation rate |
|---|---|---|---|
| Operating unit personnel | 17 | 42 | 40% |
| Pool personnel | 3 | 7 | 43% |
| Maintenance workers | 16 | 17 | 94% |
| Total exposed | 36 | 66 | 55% |
| Packaging unit personnel | 13 | 23 | 57% |

The exposed and unexposed groups were comparable with respect to sex (only one woman in the study) and race (both groups 83% white), but the exposed group was significantly older and had worked at the plant significantly longer than the unexposed group (Table 5). Furthermore, operating unit personnel were significantly older and had worked longer than maintenance workers, the latter being comparable to the unexposed group.

Except for n-hexane, the exposed group did not report significantly greater past or present exposure to any of a variety of chemicals, including methyl chloride (26 of 33 exposed, eight of 12 unexposed, p = 0.3, Fisher's exact test, 1-tailed). All 17 operating unit personnel, however, reported exposure to methyl chloride, compared to nine of the other 16 "exposed" workers (p = 0.003, Fisher's exact test, 2-tailed). Maintenance workers more frequently reported exposure to benzene than did either operating unit or packaging unit personnel. Packaging unit personnel, apparently because of a forklift in the shipping building, more frequently reported carbon monoxide exposures than did the other participants (6 of 13 vs. 4 of 35 , p = 0.02, Fisher's exact test, 2-tailed).

The exposed and unexposed groups were comparable with respect to cigarette smoking, alcohol consumption and use of medication. The exposed group reported significantly more exposure to irritant fumes than the unexposed group (30 of 36 vs. 6 of 13, p = 0.2, Fisher's exact test, 1-tailed), but except for more "sinus trouble," did not have significantly greater prevalences of a variety of mucous membrane and respiratory tract symptoms and conditions. The two groups did not differ significantly with respect to a variety of past and present medical conditions.

Of the 24 questions addressing possible neurological symptoms, only one was more common (at a statistical significance level of 0.05) among the exposed workers: 9 of 27 reported trouble sleeping, compared to 0 of 13 unexposed (p = 0.04, Fisher's exact test, 1-tailed).

There were no significant differences in POMS scores between the exposed and unexposed groups or among the exposed subgroups (Table 6).

## VI. CONCLUSION

The medical study did not demonstrate any consistent pattern of acute or chronic health effects attributable to methyl chloride (or other associated) exposures among operating unit and maintenance personnel at the butyl rubber plant. While the results may have been biased by the low participation rates among both operating unit and packaging unit personnel, the relatively low environmental levels of methyl chloride may explain the apparent absence of acute health effects attributable to it.

## VII. RECOMMENDATIONS

1. During the dryer shift operation all involved personnel should utilize appropriate supplied air respirators and be familiar with their use and maintenance. All such equipment should be inspected monthly to verify the tightness of all connections and insure that the regulator and warning devices function properly.

2. Aluminum chloride is recognized as an acute local irritant. Although none was detected by air sampling, special care should be exercised in its storage and handling, as related to the charging operation.

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## X. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), 5285 Port Royal, Springfield, Virginia, 22161. 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. Cities Service Company, Lake Charles, Louisiana
2. Local 4-500, Oil, Chemical and Atomic Workers
3. U.S. Department of Labor, Region VI
4. NIOSH, Region VI
5. Louisiana State Department of Health

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

Table 1

Personal Breathing-Zone Concentrations of
Methyl Chloride

Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

November 13-18, 1980

| Sample Number | Date of Sample | Location | Sampling Period | Concentration ($mg/M^3$)* |
|---|---|---|---|---|
| MC-1 | 11/13/80 | Aluminum Chloride Charging Area - Operator | 0734-0915 | 3 |
| MC-2 | 11/13/80 | Aluminum Chloride Charging Area - Operator | 0734-0915 | 5 |
| MC-10 | 11/17/80 | Dryer Shift - Compressor Operator | 0857-0927 | 131** |
| MC-20 | 11/18/80 | Finishing Area. 'A' Expander Operator | 0719-1415 | 14 |
| MC-21 | 11/18/80 | Finishing Area. 'B' Expander Operator | 0811-1425 | 8 |
| MC-22 | 11/18/80 | Finishing Area. 'B' Scales Operator | 0723-1416 | 11 |
| MC-23 | 11/18/80 | Finishing Area. 'A' Scales Operator | 1720-1415 | 5 |
| MC-24 | 11/18/80 | Packaging Area - Shredder | 0734-1418 | 40 |
| MC-25 | 11/18/80 | Packaging Area - Packager | 0731-1419 | 10 |
| MC-26 | 11/18/80 | Packaging Area - Boiler Operator | 0820-1415 | 12 |
| MC-27 | 11/18/80 | Dryer Shift - Compressor Operator | 1254-1311 | 343** |
| MC-28 | 11/18/80 | Dryer Shift - Fractionization Area | 1251-1311 | 647** |
| MC-29 | 11/18/80 | Dryer Shift - Reaction(s) Area | 1259-1311 | 108** |

U.S. Department of Labor (OSHA) Standard (8-hr. TWA).....210
U.S. Department of Labor (OSHA) Standard (Ceiling).....420
American Conference of Governmental Industrial Hygienists.....105
Threshold Limit Value (8-hr. TWA)

* $mg/M^3$ - milligrams of substance per cubic meter of air sampled
** Short-term (ceiling) samples

Table 2

Personal Breathing-Zone Concentrations of
Total and Respirable Dust

Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

November 17, 1980

| Sample Number | Location | Sampling Period | Concentration ($mg/M^3$)* | |
|---|---|---|---|---|
| | | | Respirable | Total |
| 2610(R)/2620(T) | Finishing Area 'B' Expander Operator | 0727-1427 | 0.14 | 0.22 |
| 2612(R)/2529(T) | Finishing Area 'A' Expander Operator | 0735-1429 | 0.14 | 0.14 |
| 2615(R)/2520(T) | Finishing Area 'B' Scales Operator | 0739-1427 | 0.17 | 0.27 |
| 2606(R)/2623(T) | Finishing Area 'A' Scales Operator | 0742-1429 | 0.12 | 0.20 |
| 2627(R)/2613(T) | Line Man 04 (Pool) | 0748-1431 | 0.03 | 0.04 |
| 2624(R)/2618(T) | Line Man 05 (Pool) | 0753-1430 | (a) | 0.10 |
| U.S. Department of Labor (OSHA) Standard (8-hr TWA)..... | | | 5.0 | 15.0 |
| American Conference of Governmental Industrial Hygienists Threshold Limit Value (8-hr TWA)..... | | | 5.0 | 10.0 |

* $mg/M^3$ - milligrams of substance per cubic meter of air sampled
(a) Below lower limit of detection of analytical method (0.01 milligrams per filter)

Table 3

Personal Breathing-Zone Concentrations of
Zinc Stearate and Aluminum Chloride

Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

November 19, 1980

| Sample Number | Location | Sampling Period | Concentration ($mg/M^3$)* | |
|---|---|---|---|---|
| | | | Zinc Stearate | Aluminum Chloride |
| ZA-1 | Finishing Area--'B' Expander Operator | 0725-1420 | (a) | (a) |
| ZA-2 | Finishing Area--'B' Scales Operator | 0730-1420 | 0.01 | (a) |
| ZA-3 | Finishing Area--'A' Expander Operator | 0732-1420 | (a) | (a) |
| ZA-4 | Finishing Area--'A' Scales Operator | 0736-1420 | 0.02 | (a) |
| ZA-5 | Packaging Area--Packager | 0740-1422 | 0.05 | (a) |
| ZA-6 | Packaging Area--Shredder | 0744-1422 | 0.03 | (a) |
| ZA-7 | Packaging Area--Boiler Operator | 0756-1430 | 0.42 | (a) |
| American Conference of Governmental Industrial Hygienists Threshold Limit Value (8-hr TWA) | | | 10.0(b) | 2.0(c) |

* $mg/M^3$ - milligrams of substance per cubic meter of air sampled
(a) Below lower limit of detection of analytical method (zinc stearate, 10 micrograms per sample; aluminum chloride, 30 micrograms per sample)
(b) No specific standard/recommendation; considered as nuisance particulate
(c) No specific standard/recommendation; considered as soluble aluminum salt

Table 4

Personal Breathing-Zone Concentrations of
Hydrogen Chloride

Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

November 13, 1980

| Sample Number | Location | Sampling Period | Concentration ($mg/M^3$)* |
|---|---|---|---|
| HC-1 | Aluminum Chloride Charging Area - Operator | 0734-0915 | 1.4 |
| HC-2 | Aluminum Chloride Charging Area - Operator | 0734-0915 | 0.4 |

U.S. Department of Labor (OSHA) Standard (Ceiling).....7.0
American Conference of Governmental Industrial Hygienists.....7.0
Threshold Limit Value (Ceiling)

* $mg/M^3$ - milligrams of substance per cubic meter of air sampled

Table 5

Age and Seniority of Medical Survey Participants

Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

December 1980

| | Exposed to Methyl Chloride | | | | Packaging Unit Personnel (Unexposed) |
|---|---|---|---|---|---|
| | Operating Unit Personnel | Pool Personnel | Maintenance Personnel | Total | |
| Number of Participants | 17 | 3 | 16 | 36 | 13 |
| Age (years) | | | | | |
| Range | 34-56 | 33-43 | 19-57 | 19-57 | 19-40 |
| Mean ± s.d.* | 46 ± 5.8 | 37 ± 5.3 | 31 ± 9.6 | 39 ± 10.5 | 29 ± 6.1 |
| Median | 46[A] | 35 | 30[A] | 40[B] | 30[B] |
| Years at plant | | | | | |
| Range | 13-34 | 12-14 | < 1-11 | < 1-34 | < 1-10 |
| Mean ± s.d.* | 21 ± 5.7 | 13 ± 0.8 | 3 ± 2.6 | 13 ± 9.9 | 5 ± 3.8 |
| Median | 24[C] | 13 | 3[C] | 13[D] | 3[D] |

* - Standard deviation

A - $p = 0.0001$, Wilcoxon rank sum test
B - $p = 0.004$, Wilcoxon rank sum test
C - $p < 0.0001$, Wilcoxon rank sum test
D - $p = 0.009$, Wilcoxon rank sum test

Table 6

"Profile of Mood States" Scores of Medical Survey Participants

Cities Service Company
Butyl Rubber Plant
Lake Charles, Louisiana

December 1980

| | Exposed to Methyl Chloride | | | | Packaging Unit Personnel (Unexposed) | p* |
|---|---|---|---|---|---|---|
| | Operating Unit Personnel | Pool Personnel | Maintenance Personnel | Total | | |
| Number of Participants | 17 | 3 | 16 | 36 | 13 | |
| Scores: Median (range) | | | | | | |
| Tension-anxiety | 9 (1-20) | 5 (1-12) | 8 (2-21) | 8 (1-21) | 5 (4-13) | 0.22 |
| Depression-dejection | 6 (0-28) | 3 (0- 6) | 5 (1-24) | 6 (0-28) | 2 (0-15) | 0.12 |
| Anger-hostility | 7 (0-38) | 8 (3-11) | 6 (0-26) | 7 (0-38) | 4 (0-12) | 0.10 |
| Vigor-activity | 16 (0-31) | 21(16-29) | 18 (7-27) | 16 (0-31) | 19 (0-29) | 0.87 |
| Fatigue-inertia | 4 (0-13) | 1 (0- 4) | 6 (0-21) | 4 (0-21) | 3 (0- 8) | 0.40 |
| Confusion-bewilderment | 4 (0-10) | 6 (1- 6) | 4 (1-10) | 4 (0-10) | 4 (2-11) | 0.61 |

* Difference between total exposed and unexposed, Wilcoxon rank sum test

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