I0553 Region-6 IWS-60-13

PLANT NAME:	Kaiser Aluminum, Chemical Division
PLANT LOCATION:	Gramercy, Louisiana
PLANT CONTACTS:	P.H. Fournet - Environmental Engineer T. Bates - Industrial Hygienist D. English - Personnel Director W. Skucllareck - Safety and Health Supervisor
PURPOSE OF VISIT:	Site visit for the determination of feasibility for the facility to be included in an epidemiological study on the health effects of workers exposed to carbon tetrachloride.
DATE OF VISIT:	May 14, 1976

PROCESS INVOLVING USE OF CARBON TETRACHLORIDE AND CHLOROFORM:

The process involves the production of fluorocarbons K-11 and K-12. Carbon tetrachloride, HCL, Amonium chloride and Caustic are combined and reacted at moderate temperature and pressure. The reacted material is passed through two stripping columns: the first to separate chlorofluorocarbons K-11 from K-12 and to remove hydrochloric acid; the second to remove unreacted carbon tetrachloride and water vapor. The finished product is passed through compressors and condensed to a liquid. The liquid is shipped via tank truck or pressure cylinder. Chloroform is the starting material in the same process to produce chlorofluorocarbon K-22.

POTENTIAL HEALTH HAZARDS:

1. Eye, skin, and respiratory exposure to carbon tetrachloride as the material is unloaded from tank trucks to storage. These individuals are not employees of Kaiser Chemical, and consequently are not subject to the same safety and health standards required of Kaiser employees.

RECORD STATUS:

The personnel records seem to be above average in meeting the requirements for use in an epidemiological survey of the occupational population they represented.

Work Sheet

for

Preliminary Industrial Hygiene
Survey of

Plant Name: Kaiser Chemical

City, State: Gramercy, Louisiana

Survey Date: May 14, 1976

Survey Conducted By: Richard Hartle
Mark Boeniger
Ted Meinhardt

Industrial Hygiene Section
Industry-Wide Studies Branch
Division of Surveillance, Hazard Evaluations and Field Studies
National Institute for Occupational Safety and Health
Cincinnati, Ohio

I. General:

1. Establishment Name Kaiser Chemical

Address _____ City Gramercy

State Louisiana Zip Code _____ Tel. No. _____

2. Persons Interviewed P.H. Fournet

Title Chief Environmental Engineer

Others: T. Bates, Industrial Hygienist, D. English, Personnel Director

3. A) Union Representative: Wyatt Chester

Title _____ Telephone Number _____

B) Name of Union(s) United Steel Workers

5. NIOSH Staff Present Richard Hartle, Mark Boeniger, and Ted Meinhardt.

II. Plant Description:

1. Is plant a subsidiary or independently owned? Owned

Name of parent company _____

Legal Owner _____

2. Date plant built original - 1956; Aluminum plant - 1959.

Date of plant additions Hydrogen fluoride - 1961; fluorocarbons - 1962.

3. Acreage of plant site 1,600 usable. 3200 total.

4. Number of major buildings _____ Total Square Feet _____

5. A) How many people are on your payroll at the present time? 1000

B) Of this number, how many are normally in the

Production Area? 300

Administrative Area? 700

Other Areas? _____

6. Number of Shifts 3

7. Number of employees/shifts? Varies as they meet supply with demand.

III. Description of Process:

1. What are your major products or services? (list)

Alumina	Refrigerants
Chlorine	Aluminum Fluoride
Caustic	Calci-Coke (high grade carbon)
Hydrogen Fluoride	

2. Plant Processes

A) Product Fluorocarbon K-11, K-12.

Raw materials and possible contaminants

Carbon Tetrachloride	Caustic
HCL	
Amonium Chloride	

Production Processes Combine raw materials ~~in reactors~~ at moderate temperature and pressure in reactor vessel. Pass through two stripping columns. One to separate chlorofluorocarbons 11 from 12 and to remove Hydrochloric Acid. Two removes remaining carbon tetrachloride and wate vapor. This finished product is passed through compressors and condensed to a liquid.

B) Product Chloroflourocarbon 22

Raw materials and possible contaminants

Chloroform	
Hydrogen Fluoride	
Antimony Chloride	

Production Processes Same as in 2A, except chloroform is used as the starting material in place of carbon tetrachloride.

IV. Description of Medical, Safety and Industrial Hygiene Programs:

1. A) Does your company employ an industrial hygienist?

Yes, at this location X

Yes, at corporate headquarters_____

Yes, on a consulting basis_____

Yes, insurance carrier_____

Yes, specify Work is divided between this and another facility

No_____

B) Name Tom Bates Telephone Number (504) 869-5711

Address Gramercy, Louisiana

C) What types of measurements are routinely taken? Explain.

Personal and area air samples of some potentially hazardous areas.

Spot samples for vessel entry.

D) Were industrial hygiene measurements obtained: Yes_____ No X

2. Do you have an agreement with a physician to give your employees emergency or other medical car?

Yes, at this location--full-time_____

Yes, at this location--part-time X Dr. Agnamoore
Dr. Cherians

Yes, on call X Dr. Turner

No_____

Name_____ Telephone Number_____

Address_____

3. Do you have a licensed nurse in your facility at a regular time?

Yes, Full-time X (2) Yes, Part-time_____ No_____

4. Do you have an employee at this facility on each shift with formal first aid training, other than doctors or nurses, who has been designated to provide emergency treatment?

Yes X No_____

5. When you hire a new employee, do you require him to take a medical examination?

Yes, all employees X

Yes, some employees_____

No_____

6. Do you provide any periodic physical examinations for your employees?

Yes X No_____ How Often annually

7. Do you provide special job related medical tests for your employees, such as:

Chest X-Ray	Yes X	No_____
Hearing Tests	Yes X	No_____
Visual Tests	Yes X	No_____
Lung Function Tests	Yes X	No_____
Blood Tests	Yes X	No_____
Urine Tests	Yes X	No_____
Other	Yes X	No_____

Specify: EKG

8. A) Does your company have a formal safety program? Yes X No_____

B) Safety and Health Supervisor Wolfgang Skucllareck

C) How many people are involved in this program? 3

D) How many lost-time accidents did you have last year?

Frequency _____ Severity _____

9. Has there been any medical abnormalities among workers which can be contributed to an occupational exposure?

Explain No

10. What protective equipment is required:

Equipment Provided by Employer

Clothing	Yes _____	No X
Glasses	Yes X	No _____
Shoes	Yes X	No _____
Respirators	Yes X	No _____

Type mouth-piece escape respirator (all process areas)

Where Used _____

Other Scott supplied air type when cleaning reactors.

11. A) Are there facilities for taking showers?

Yes X No _____

B) Are there facilities for changing clothes?

Yes X No _____

C) Obtained descriptive literature on products?

Yes _____ No X

V. Narrative:

1. Description of Medical, Safety and Industrial Hygiene Program:

Both the Industrial Hygiene and Medical programs seemed good. It seemed that much emphasis was placed on job safety as we noticed signs, plaquards and billboards relating to safety appearing throughout the facility.

2. Potential Health Hazards:

Eye, skin, and respiratory exposure to HCL.

Eye, skin, and respiratory exposure to carbon tetrachloride.

Eye, skin and respiratory exposure to chloroform.

Eye, skin, and respiratory exposure to caustics.

3. Have product lines changed over the years? (If they have, include any other raw materials used).

NO

4. Are waste products reused: (If not, how are they disposed?)

NO - the Caustics and Acids balanced from the production process and they were able to combine and neutralize the materials. If any HCL remained, they contained it and sold it as such.

5. Briefly describe any past air sampling data.

Past sampling data plus methods used are attached as Appendix II.

6. Describe status of personnel records. (i.e. completeness of records - social security numbers, work history, lost time accident data, availability of past records, etc.)

The records seemed to be above average in relating to meeting the requirements for use in an epidemiological survey of the occupational population they represented.

7. Ventilation: (include type, size, kinds of collectors, H.P. of blowers, etc.)

History of Changes

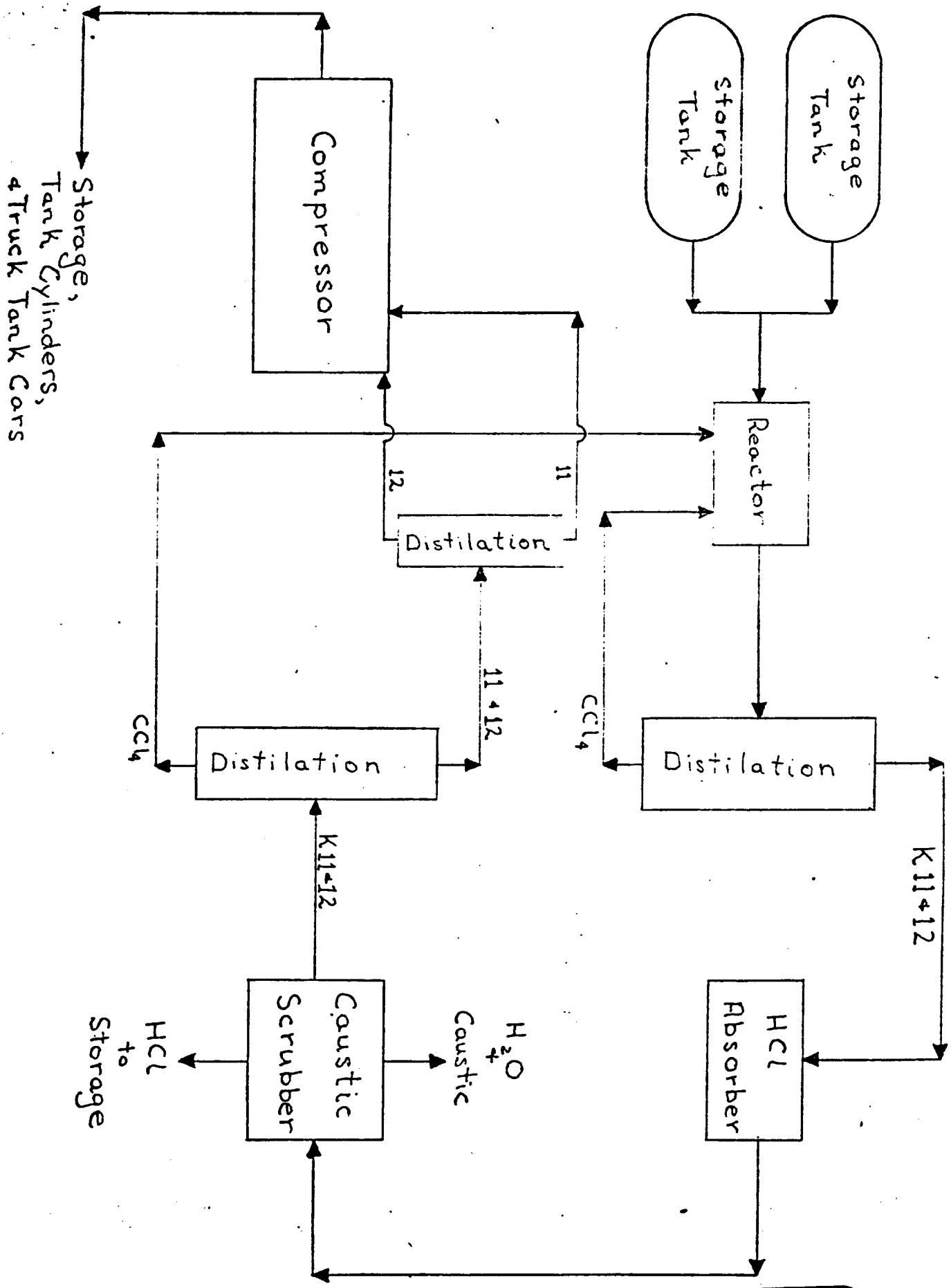
The processes involving carbon tetrachloride were situated out of doors.

8. Housekeeping:

Housekeeping seemed adequate in that no unnecessary obstacles were present around the production process and spilled liquid materials appeared to have been removed by using a commercial absorber.

9. Miscellaneous:

Appendix I - Flow Chart of Fluorocarbons Process



Appendix II

CARBON TETRACHLORIDE DATA

Sample Number	Sample Source and Date	Milligrams Organic/Cubic Meter of Air CCl_4 TLV=65
1	F.C. Operator - Production Unit and Tank Farm. 7/11/74	0.0007
2	F.C. Operator - Same Area, Different Operator. 7/3/74	0.00006
3	F.C. Operator - Same Area, Different Operator. 7/5/74	0.00006
4	F.C. Day Operator (includes unloading CCl_4 railcar) 6/26/74	0.00006
5	F.C. Day Operator - Normal Duties in Production Unit and Tank Farm. 7/3/74	0.0005
6	F.C. Day Operator - Production Unit and Tank Farm. 7/5/74	0.0002
7	Bulkloader - Loaded K-12 Trailer and Two Cars of K-12. 6/27/74	0.0004
8	Bulkloader - Unloaded K-22, Loaded K-11 and K-12 Cars. 7/2/74	0.00006
9	Bulkloader - Loaded K-11 and K-12. 7/3/74	0.0003
10	Cylinder Filler (small line) 25#, K-12. 6/27/74	0.00006
11	Cylinder Filler (small line) 25#, K-22. 7/2/74	0.00006
12	Cylinder Filler (large line) 50#, K-12. 6/26/74	0.00006
13	Cylinder Filler (large line) 25#, K-12. 6/27/74	0.0016
13B	Cylinder Filler (large line) 25#, K-22. 7/2/74	0.00006
14	Cylinder Filler (drum line) K-11 drums. 7/1/74	0.00006
15	Cylinder Filler (drum line) K-11 drums. 7/8/76	0.00006

APPENDIX II

(continued)

Kaiser Chemical presented this data on workers exposure levels to carbon tetrachloride by date and operation as indicated. The results were obtained using the following sampling and analytical methods.

Personal air samples were obtained using MSA model G personal sampling pumps. Air was drawn from the breathing zone of the worker and passed through two charcoal tubes in series. Each tube contained 600 mg. of coconut shell charcoal; 400 mg. in the initial section and 200 mg. in the back-up section. We were informed by the chemist who supervises the sampling at Kaiser that the tubes were made by SKC.

The air samples were collected over an eight-hour period. The flow rate averaged .6 ℓ/min., with a total volume of approximately 300 liters. However, the flow rate continually decreased during the sampling period due to weakening batteries.

Analysis of the samples was conducted by Micro-Tech Laboratories. Both sections of the first tube in the series and the first section of the second tube were analyzed, resulting in a total of 1000 mg. of charcoal per sample for analysis. A GC 550 was used for the quantitative and qualitative analysis of the samples.

The data presents mg. of carbon tetrachloride per cubic meter of air. Some question was raised as to the ability to detect such small quantities of carbon tetrachloride. In order to establish a .0007 mg./m^3 exposure level from 300 liters of sampled air, a .0002 limit of detection must have been obtained. At the time of the survey, we were given information which stated that Kaiser Chemical's samples were analyzed using the same methods employed by the NIOSH laboratories. A discrepancy appears here in that the NIOSH laboratories have a limit of detection of .002 for organic vapors. Contact was made with Kaiser in an attempt to locate the differences in analytical methods. We were told that the low quantities of carbon tetrachloride were detectable because of two division peaks. The NIOSH laboratories were not familiar with this technique and are currently studying it for verification.