

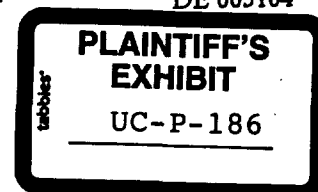
INDUSTRIAL HYGIENE SUMMARY REPORT
July 1 - December 31, 1961

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RESEARCH AND DEVELOPMENT DEPARTMENT
UNION CARBIDE CHEMICALS COMPANY

DE 005104



*Particularly
Pertinent*

During this report period three noteworthy trends developed. Of greatest significance, the programs in the Technical Center, and the Institute and South Charleston Plants responded in a highly commendable manner to the almost overwhelming volume of requested work. The newest of these programs, under the supervision of the Technical Center Medical Department, filled a long-standing and acute need. One especially important accomplishment was to bring the Technical Center departments into compliance with their AEC licenses for the use of radioactive materials. A continuing program to maintain that status of compliance is now in effect. The smaller plants also responded capably to their less numerous but no less important problems.

Secondly, there was evidence of an expanding utilization of the knowledge and experience gained by these plant programs as a sales tool in the increasingly competitive market. This is most encouraging, as it has long appeared to the writer that we were not making this potential sales aid available as effectively as could be expected.

On a less encouraging note, lack of personnel made it necessary for the Research and Development Department to seriously curtail the technical support normally given the plant programs. This was the result of transferring one man to the Nuclear Company and loaning another man to the Technical Center Medical Department. Effort is now being made to correct this deficiency by procuring the required staff.

N. H. Ketcham

N. H. Ketcham
Industrial Hygiene Consultant

CONTENTS

	Page
Technical Center -----	1-3
South Charleston Plant -----	4-9
Institute Plant -----	10-12
Brownsville Plant -----	13
Torrance Plant -----	14-16
Whiting Plant -----	17
Texas City Plant -----	18
Seadrift Plant -----	19

TECHNICAL CENTER

(Period August 1, 1961 to January 31, 1962)

An industrial hygiene service was initiated for the Technical Center beginning August 1, 1961. The work was done by Mr. J. D. Cavender, under the supervision of Dr. E. M. Best, Jr., Technical Center Medical Director. The highly impressive quality, volume, and variety of the work is indicated by the following information abstracted from a thirteen-page report prepared by Mr. Cavender and Dr. Best.

One especially noteworthy accomplishment is described. This involved bringing all of the Technical Center departments into compliance with their AEC licenses for the use of radioactive materials. A continuing program to maintain that status of compliance is now in effect.

TOLYLENE DIISOCYANATE

Studies of the concentration of TDI in the air were made at six different locations. Hazardous concentrations were found in two of these locations. Recommendations were made and corrective actions were taken. Periodic testing of the air is being continued at five of the locations.

Investigation of a more sensitive analytical method for TDI was required when the "Threshold Limit Value" was lowered from 0.1 to 0.02 parts per million, by volume in air. Three possible techniques were investigated. One of these was found suitable and was used for the above studies.

PHOSGENE

Studies of phosgene in air were made at three locations. Hazardous concentrations of phosgene were found at two of these locations and corrective measures were suggested. Additional periodic air sampling has been scheduled.

ROCKET FUELS

The presence of an unidentified highly irritant air-borne contaminant in the vicinity of solid rocket fuel production was studied. Considerable methods application work had to be done in preparation. No positive identification of the irritant material was made. Two logical possibilities were ruled out.

Studies concerning three other rocket fuel components known to be unusually toxic have been initiated, and are continuing. For security reasons, reporting of this work will be limited. Considerable continuing methods application work will be required in order to provide the project with the needed air analyses.

MERCURY

DE 005107

Sixteen air sampling surveys were made at 14 locations. Several of these studies revealed high concentrations of mercury vapor which necessitated corrective action. As a result of these

findings, a routine air sampling program for the most hazardous areas has been established.

NICKEL CARBONYL

Operation of the Acrylic Acid Pilot Unit required daily selection for analysis of urine specimens contributed by the operating personnel. One hundred and twenty-eight specimens were sent to, and analyzed by, the Quality Control Laboratory for nickel content. Two of these analyses were on an emergency basis to support or disprove clinical impressions.

The MSA "Billionaire" Analyzer, which records and serves as an alarm for nickel carbonyl concentrations in the air at the Acrylic Acid Pilot Unit, continued to require minor servicing and periodic calibration.

As a further check on the atmospheric nickel carbonyl concentration, three to five-day air samples were taken with air scrubbers. Sixty-four of these air samples were collected and given to Plant 514 Quality Control Laboratory for nickel carbonyl determinations.

1-NAPHTHOL

Ten days were spent early in the Fall assisting in a special air sampling study at the Institute Plant, as requested by Dr. R. J. Sexton. This was before Mr. R. E. Peele had assumed responsibility for the work at that location.

COBALT CARBONYL

A brief investigation was made of a possible cobalt carbonyl exposure of a Research and Development Department employee working at the South Charleston Plant. This was done in cooperation with Mr. B. L. Murray.

DICHLOROBENZENE

Air analyses for dichlorobenzene were obtained in two locations. Both of these are scheduled for additional study. Methods application work was required in preparation for sampling.

RADIATION

There are twenty-six radiation sources now in the Technical Center that are subject to the safety provisions stipulated in the AEC licenses. In addition there are numerous devices which emit radiation but are not subject to AEC control. These include radium sources and electronic equipment utilizing X-radiation. The following work essential to the legal and safe use of these devices is summarized as follows:

1. Eighteen radiation sources were inspected and tested in compliance with the AEC requirements applicable to the devices.

2. Twenty radiation survey meter calibrations were made. This work is done for the South Charleston and Institute Plants, as well as for the Technical Center.

3. Monitoring was provided when 1000 curies of Cobalt⁶⁰ were installed at the Radiation Laboratory, Research and Development Department.

4. Assistance was given in monitoring a Strontium⁹⁰ source in a gas chromatograph while the instrument was being repaired.

5. Twelve pieces of equipment emitting radiation not controlled by the AEC were monitored.

6. The required records and reports on the radiation sources, and the required records of personnel exposure have been issued for permanent filing.

CARBON MONOXIDE

Continuous air analyzers were installed and used in two locations. In each location one alarm was given by the analyzer, indicating an excessive concentration of carbon monoxide. Recommendations were made and corrective action was taken.

"LEAKING" RADIUM SOURCES IN MSA "BILLIONAIRE" PHOSGENE AND NICKEL CARBONYL ANALYZERS

In connection with work done on both the phosgene and nickel carbonyl analyzers, it was found that the radium foil sources "leak" a potentially hazardous amount of radium and/or radon daughter products. These radium sources must be cleaned periodically to insure proper operation of the instruments. Instructions have been given to insure that this is done only by someone fully aware of the hazard and qualified to do it safely.

HYDROGEN CYANIDE

Several locations where hydrogen cyanide is used have been identified. Air sampling will be initiated at an early date.

AGRICULTURAL CHEMICALS

Special studies have been requested in locations where potentially hazardous insecticides, miticides, nematocides, etc. are being handled. Little progress has been made in starting this work.

PILOT PLANT OPERATIONS

A list of employees working with pilot-scale equipment and two or more of a group of ten potentially hazardous chemicals has been received. Air sampling should be done in several of the locations involved. Little progress has been made in starting this work.

SOUTH CHARLESTON PLANT

The following information was taken from a seven-page summary report written by Mr. B. L. Murray. The program at the South Charleston Plant continues to reflect an extremely large volume and variety of requests for industrial hygiene services. Laboratory work in support of the program is done by the Quality Control Laboratory. Increasingly valuable participation by the Works Engineering Department is being made in the areas of noise reduction, ventilation, and radiation instrumentation and protection.

During the period of this report, a formal definition and approval of the Plant's radioactivity protection program was accomplished. This included issuance of Plant Letter Number 390 in which specific responsibilities were defined. Also, during this period approval was granted for a revision of the Hazardous Work Permit to include pertinent information relating to radioactive sources, toxic vapors, and ventilation.

A total of 121 projects, as shown in the following table, were active. The column on the far right marked "Special" denotes requests from production supervisors for work in support of their responsibilities

<u>Number</u>	<u>Projects</u>	<u>Regularly Scheduled</u>	<u>Special</u>
11	Sound studies	4	7
38	Sampling of gases and vapors in air	8	30
8	Sampling of dusts in air	1	7
12	Promotional and training projects	1	11
2	Ventilation problems	1	1
17	Radiological health studies	7	10
33	Sanitation	23	10
<u>121</u>		<u>45</u>	<u>76</u>

NOISE

Eleven noise problems were evaluated or are in the process of being studied to evaluate the risk to the hearing of employees. Of these eleven potential problems, shop orders have been issued to provide corrective engineering work in seven of the locations. A brief description is given below:

<u>Bldg.</u>	<u>Location</u>	<u>Problem and Objective</u>	<u>Status</u>
12	Mainland Steam Power Plant	To reduce the vibrating surface at the base of turbo generator to reduce the average low frequency sound level (75-150 cps) from present 109 db to 90 db or lower.	Under study

Bldg.	Location	Problem and Objective	Status
149	Dual Anhydride Unit	To isolate disturbance in the nitrogen blow-off system to increase recommended exposure time from 110 minutes to 480 minutes. Noise was 91 db in high frequency band (1200-2400 cps).	Piping covered with Fiberglas which reduced sound level to 74 db in employee exposure zone
152	Suspension Vinyl Resin Unit	To suppress the sound at the spray precipitator, No. 1 dissolver mill, and hydraulic pump areas to reduce the 300-600 cps band from 97 to 85 db or lower.	Under study
190 193	Dispersion Resin Unit	To provide soundproof enclosure on NoVo Screen in fluidizing system, to reduce the 600-1200 cps band from 97 db to 85 db or lower. It is desired to increase the recommended exposure time in the grinding rooms which is now limited to 0.2-0.4 minutes/day (without ear protection).	The Production Department may reduce the amount of grinding done.
416	Polyethylene Blending Unit	To isolate disturbance in air conveyor system to reduce the 2400-4800 cps noise from 98 db to less than 85 db.	Piping covered with flexible polyurethane foam insulation, 1-5/8" to 2-1/4" thick. Reduced sound level to 82 db in employee exposure zone.
430	Polyethylene Hot Processing Unit	Replaced shaker screen with whizzer drier and decreased the recommended exposure time from 350 minutes to 52 minutes.	This increase in noise was unexpected.
430	Polyethylene Hot Processing Unit	Steam reducer may be contributing significantly to the noise.	Steam reducer will be moved to another location.

The other four possible problems - Acetic Anhydride Furnace (Building 145), Chlorohydrin (Building 7), Island Powerhouse (Building 151), and Crotonaldehyde (Building 136) are still being studied.

AIR SAMPLING STUDIES

Of the thirty-eight air sampling studies undertaken, thirty were requested by production supervision. The investigations and the corrective action taken to prevent or control these hazards are outlined as follows:

Acetic Acid, Propylene Dichloride, and Ethylene Oxide Vapors in the Air: Shop Orders were issued to provide ventilation measures to control these vapors in the working environment.

<u>Bldg.</u>	<u>Location</u>	<u>Vapor Problem</u>	<u>Status</u>
Yard Area N Bldg. 149	Exterior Drum Filling Station	Vapors produced when filling 50-gallon drums with acetic acid. Concentrations of 8,000 ppm downwind.	Installed ventilation system on drum-filling line.
82	Underpass for Employees	Propylene dichloride vapors from pump room in underpass. Concentrations of 200 ppm were recorded at breathing level.	Under study
43	Mainland Shipping	Ethylene oxide vapors when filling, purging, and cleaning drums and cylinders. Breathing level concentrations were in the range of 50 to 200 ppm.	Under study

Ethylene Dichloride, Propylene Chlorohydrin, and Propylene Dichloride Vapors in Tanks: Two of the three tanks tested for toxic vapors had contained ethylene dichloride, and after a thorough cleaning and purging with air the concentrations were reduced to a safe level. The third tank had contained propylene dichloride and propylene chlorohydrin. After a thorough cleaning and purging with air the concentration of vapors at breathing level were reduced from 400 ppm to less than 25 ppm.

Carbon Monoxide Vapors from Fork-Lift Gasoline Trucks and Power Sweeper: These trucks and the sweeper, operating inside the Rex and Atlas Warehouses, were studied to determine the concentration of carbon monoxide vapors in the working environment. The samples obtained showed concentrations in the range of 20 to 80 ppm at breathing level. Although the concentrations of carbon monoxide vapor did not exceed the "Threshold Limit Value" of 100 ppm, it was emphasized that if the trucks or power sweeper were allowed to operate in confined spaces, respiratory protection would be advisable.

Mercury Vapor in the Atmosphere: Air analyses were made for mercury vapor at 10 locations. At breathing level, there were no concentrations which exceeded the "Threshold Limit Value" of 0.1 mg Hg/M³. In the 10 locations tested, the average concentration of mercury vapor at bench-top level and floor level was in the range of 0.2 to 0.6 mg Hg/M³. These concentrations were reduced to less than the "Threshold Limit Value" through a good-housekeeping program.

Benzene Vapor in Air: As a part of a plant-wide study now in progress to determine the benzene vapor concentrations in the working environment, five areas were evaluated. These areas included the Refinery; Gas Separation No. 2 and No. 3; Quality Control Laboratory, Building 107; and the Acetic Esters Unit, Building 146. Forty breathing level concentrations were determined, and of this number only seven exceeded the "Threshold Limit Value" of 25 ppm. The Refinery Area showed the greatest need for corrective action with benzene concentrations at breathing level in the pump room at approximately 60 ppm. The effort expended in keeping the pumps from leaking, instructions for operators to avoid unnecessary breathing of vapors, and the limited time the operators spend in this area (2 hours per day) are important factors in limiting the exposure.

Welding Fume in Air: Samplings of welding fume were made to determine the welders' exposure at the Maintenance Shop, Building 307. The samples obtained with the electrostatic precipitator, which measures the concentration of metallurgical fume outside the welder's helmet, showed a mean of 134 mg/M³. To obtain representative exposure data, a welder's hood was fitted with a one-inch diameter aluminum filter holder which placed the filter immediately in front of the nose and mouth. Samples obtained by this method showed a mean of 24 mg/M³. In the general shop area the concentration of fume was 8 mg/M³ and 15 mg/M³ for the electrostatic precipitator and the filter paper samples, respectively. The filter samples were collected on Millipore and fiberglas paper.

Hydrogen Sulfide in Air at Sewer Outlet: Twenty air samples were taken to show the concentration of hydrogen sulfide at breathing level during repair of a broken sewer line. The majority of samples showed concentrations to be less than the "Threshold Limit Value" of 20 ppm. In one instance the hydrogen sulfide concentration exceeded 500 ppm. Evacuation procedures were immediately put into effect and the area rechecked before maintenance work was resumed.

Carbon Monoxide in Air: This study was made to determine the concentration of carbon monoxide when electricians of the Maintenance Department were installing an inter-communication line in the trenches and through the basement areas of the No. 3 Gas Separation Unit. Twenty-five per cent of the samples showed concentrations of carbon monoxide in the range of 200 ppm. The "Threshold Limit Value" for carbon monoxide is 100 ppm. The workers were evacuated during these periods and rechecks were made before the maintenance work was resumed.

Hydrocarbon Vapor in Air: Samples were obtained to determine the concentration of hydrocarbon vapor in air at the Mainland Dispensary as a result of pungent odors coming from the sewer and drainline openings inside the building. The concentration of benzene vapor at the breathing level was 25 to 30 ppm. Other hydrocarbons found at the breathing level were recorded in ppm as: butadiene, 1200; butene, 1600; vinyl acetylene, 1000; cyclopentadiene, 70; isoprene, 170; pentene, 100; and pentane, 60. The source of the contaminant from the sewer was corrected and the vapor concentration at the Dispensary rechecked and found to be at a safe level.

Methane and Ethane Vapor in Air: A utility tunnel near Building 107 was tested before the employees entered to do repair work. The concentration of methane was 500 ppm and ethane 200 ppm. The test for oxygen deficiency was reported "safe".

Diethylamine Vapor in Air: Samples were collected to determine the concentration of diethylamine vapor in the Safety and Fire Protection Valve Shop while the men were cleaning and repairing valves. The results showed concentrations equal to the "Threshold Limit Value" of 25 ppm. Ventilation control measures were recommended.

Nickel Analyses of Air Samples and Urine Samples: This work was continued in support of the Research and Development Department's Acrylic Acid Pilot Plant. Nickel analyses were run on 110 urine specimens and on 70 air samples. The air samples were found to be below the "Threshold Limit Value" of nickel carbonyl. The urine analyses resulted in figures considered to be within the range of normal excretion values for nickel.

Community Air Pollution Studies: Analyses were made of samples collected with the high-volume samplers located at Blue Creek, Alloy, and the South Charleston City Fire Department which are control points in a continuing valley-wide study.

In addition, analyses were made of particle fallout samples from inside the plant and community areas surrounding the plant. The monitoring stations located inside the plant fences continue to show the heaviest fallout.

VENTILATION

Ventilation System Evaluated: Design consultation was provided for an additional drum-loading station at the Shipping Department, Building 303. This installation will provide a drum-filling booth for handling 50-gallon drums of toxic chemicals.

Ventilation systems are now being designed by the Works Engineering Department for handling ethylene oxide vapors at the Mainland Shipping Department, and for improving ventilation of the Building 82 underpass. A ventilation system was installed on the drum-filling line at one of the shipping stations handling acetic acid.

RADIATION PROTECTION (This work was done in cooperation with Mr. E. E. Buxton, Works Engineering Department)

Special radiation warning signs to identify radioactive sources throughout the plant were issued and posted. These signs comply with the AEC definition of "standard" signs but also provide additional instruction or information. Upon request, a supply of these signs was sent to the Texas City and Whiting Plants.

Plant Letter Number 390 on the Radioactivity Protection Program was issued on November 29, 1961, defining the responsibilities involved.

The AEC-3 form "Notice to Employees" has been posted in restricted areas in the plant in compliance with a recent change in regulations by the Atomic Energy Commission.

A revised form was issued for recording positive and negative personnel dosimeter readings. These data are reported to the Medical Department on a calendar quarterly basis.

Nineteen supervisory personnel completed an in-plant, 16-hour training course entitled "Survey of Nuclear Fundamentals and Radioisotope Applications in Industry". Our contribution to this course was an explanation of the "Leak Test Procedure" and a discussion of "Biological Effects of Radiation".

The Hazardous Work Permit was revised to include pertinent information on radioactive sources, toxic vapors, and ventilation. The revised permit should be issued early in 1962.

SANITATION

Mr. B. L. Murray served as co-chairman of the American Management Association Workshop Seminar on "Organization and Management of the Company's Industrial Sanitation Program" held from December 13 to 15, 1961, at the Hotel Astor in New York City. This Seminar was given to managers of sanitation programs with the objective of examining the function of industrial sanitation and its place in an industrial manufacturing operation; its component parts; its management requirements; the training, supervision, and scheduling of its labor; its tools and materials; its method of cost control; and its identification to top management and integration with other plant functions.

During this reporting period numerous sanitation projects were active. These included work related to drinking water supply, food service, insecticide and rodent control, specifications for new facilities, and building inspections.

INSTITUTE PLANT

(Period September 25, 1961 - February 1, 1962)

The following information is abstracted from a four-page report written by Mr. R. E. Peele. The highly commendable progress made since Mr. Peele started work at the Institute Plant in September, 1961 is noteworthy. As in the past, the laboratory work essential to the support of this plant program was done by the Institute Plant Works Laboratory.

Mr. Peele comes to us with experience in the field of industrial hygiene, and with a year of graduate study at the University of Michigan School of Public Health. He reports to Dr. R. J. Sexton, Plant Medical Director.

NOISE

An informal demonstration at the Maintenance Shop served to provide dramatic evidence of the effectiveness of Fiberglas blankets in the attenuation of excessive noise. These blankets were wrapped around heat exchangers as tube bundles were being driven out with pneumatic hammers. Noise level determinations were not made.

A complete evaluation of the noise problem at the new Linde Oxygen Plant was carried out. A report is soon to be released.

A noise survey was conducted in the High Pressure Hydrogenation Department as a result of complaints of excessive noise levels in evidence since the installation of a new acetylene blowdown stack. This report also will soon be released.

The Construction Welding and Steel Fabricating Shops were visited with Dr. Sexton and observations made of the suggested survey for noise problems. Noise determinations will be made at a later date.

Numerous complaints about the disturbing noise levels in evidence in the Plant Cafeteria during the several regular daily periods of heavy traffic resulted in a decision to evaluate the acoustical properties of the room. This information was obtained through the cooperative efforts of Mr. E. C. Harry and his staff of the Olefins Company Engineering Department. A complete evaluation of this data and recommendations are expected soon.

RADIATION

Each of the four sealed radiation sources purchased under this Plant's AEC license have been completely surveyed, recorded, and reported in accordance with both the AEC and Company requirements.

"SEVIN" INSECTICIDE PROCESS

Samples of SEVIN dust in air, expressed as mg/M³, are still being taken at weekly intervals in the SEVIN Insecticide shipping area. An evaluation of this data is now under way.

Continuous reading CO alarm devices (MSA Hopcalite cell and MSA infrared "Lira" analyzers) were considered for use in the CO section of the Synthesis Gas Unit of the SEVIN Insecticide Plant.

A special visit with Mr. T. L. Collins, Synthesis Gas Department Head in SEVIN Insecticide Area, was made to the South Charleston Plant to determine the progress accomplished by the Special Instrumentation Division in their modifications of the MSA "Billionaire" phosgene detector.

A complete atmospheric survey of the 1-naphthol concentration in evidence in the south structure of the 1-Naphthol Area of the SEVIN Insecticide Plant was conducted by this department at the same time that complete medical and physiological investigations were being conducted by Dr. Sexton and his staff. This study yielded atmospheric results substantiating those reported in the first survey of this unit.

1-Naphthol concentrations in the Acetone Unit were evaluated by this department as a result of backache complaints submitted by various operators in the unit. This report pinpointed the apparent cause of the complaints and recommended corrections for consideration by the unit head. The Medical Department is continuing with their special laboratory procedures, and after the recommended corrections in the unit have been completed further air analyses for 1-naphthol in air will be conducted.

INSULATION DUST

A complete dust survey was conducted at the Construction Insulation Fabrication Shop as a result of complaints of excessive dust concentrations produced when insulating materials are cut with standard band saws. This survey included determinations of the atmospheric dust concentrations in evidence during the times of work, as well as particle size analyses and free crystalline silica determinations which were carried out on the materials being processed. Chemical determinations for free silica were conducted in accordance with a method developed by Mr. N. A. Talvitie of the U. S. Public Health Service. Copies of this simplified chemical method will soon be circulated to interested parties.

HYDROGEN CYANIDE UNIT

Drager detector tubes were used at regular monthly intervals in revealing an indication of the HCN concentrations present in the Hydrogen Cyanide Unit. These have replaced MSA tubes used before this time. It is desired that more comprehensive daily air sampling coverage be provided by this office.

PERIODIC AIR SAMPLING

Monthly air sampling for benzene was continued in the #1 and #2 Styrene and Gas Separation Units. Air samples were taken monthly in the Fiber T Unit for acetonitrile analyses. Fly ash fallout was collected and measured monthly in various sites in the plant and in nearby community areas.

BROWNSVILLE PLANT

Information about efforts to evaluate noise problems at the Brownsville Plant was supplied by Mr. W. E. Warren. This is the first report from the newest addition to the Company's production plants.

PLANT-WIDE NOISE EXPOSURE SURVEY

Prior to the start-up of the Brownsville Plant, it was recognized that a noise problem would be experienced. The basis of this knowledge was the experience reported by the prior owners of the plant. The Oxygen Plant was the prime suspect.

In order to determine how serious the problem might prove to be, and what corrective action should be taken, arrangements were made with the Company's Industrial Hygiene Consultant to conduct a plant-wide noise exposure survey.

The survey was conducted late in the year. A comprehensive study, including all areas of the plant, was made and has been reported. The data indicates, as suspected, that a special problem exists in the Oxygen Plant and certain other locations. A program of audiometric testing, and policies requiring the wearing of ear protection are under consideration.

TORRANCE PLANT — — — —

The industrial hygiene activities of the Torrance Plant during this report period were summarized by Mr. H. T. Olson as follows:

DRIPOLENE

Considerable work has been done in the past six months in dripolene loading. These studies were prompted by two cases of dizziness which occurred to shipping attendants while unloading tank trucks of dripolene. Tests were conducted and we found that all results were well within the maximum allowable concentrations.

Annual blood tests are now being discreetly given to all men who work in this area.

A benzene chemical data sheet has been prepared and is now included in our Hazardous and Reactive Chemicals Manual.

The Gas Separation area has installed an improved dripolene separator on the clarifier which appears to have alleviated the problem of dripolene vapors.

FURNACE BUILDING

A potentially hazardous condition in the furnaces in the Gas area has been alleviated by a nitrogen purge system. This permits the individual cracking set to be purged with inert nitrogen before it is opened for burn-out. There have been no flashes since this system has been put into use.

An infrared automatic gas analyzer which has decreased the number of orsats being run by 80 per cent in the Oxide area has been installed. This has reduced the handling hazard of acids, etc. considerably.

The vent hoods have been rebuilt over the orsats in the Gas Separation area in order to reduce the vapors. These revisions have proven very successful.

ANTI-FREEZE

During the past six months, one severe case of dermatitis and two other cases where there were indications of possible future trouble were noted in our Anti-freeze shipping area. It was discovered that mercaptobenzolthiazol, a component in one of our private brand anti-freezes, was causing this dermatitis. Test samples have now been purchased in a dustless form (a granular material coated with diethylene glycol). Early results show that this should reduce materially the exposure to the sodium mercaptobenzolthiazol dust.

NOISE

Noise studies were continued from the first half of this year. Additional noise level measurements were made in a number of locations in the residential area across Hawthorne Blvd. from the plant after the Oxide Unit was back in operation. In general, the

NOISE (Cont'd)

level was found to be approximately twice that determined during the shutdown. Traffic noise from Hawthorne Blvd. and other distinctive sounds made reliable readings very difficult. Conclusive data will require additional measurements.

Ear protection was recommended for certain noisy locations within the plant and was also provided for others who requested it. The wearing of ear protection has also been made mandatory in the Vicker's room of the Polyethylene area for persons who are in there longer than 20 minutes.

DUSTS

A sheetmetal barricade has been erected to prevent dry chemicals, such as lime, borax, etc., which are being dumped into the anti-freeze mix system from blowing into the adjacent work area where shipping attendants are working.

The Polyethylene area has changed its method of charging "Superfloss" to the mixer in the manufacture of masterbatch. The material was formerly premixed in an attempt to wet it, but this merely fluffed it up and made the area more dusty. Now, "Superfloss" is added directly by screw conveyors which has much improved the dust problem. Masks are still worn, however.

CUTTING OIL

Two machinists claimed they were being poisoned by our cutting oil used on lathes in the Machine Shop. After medical tests were taken and sent to the Los Angeles Poison Control Center, all results were negative and final investigation resulted in these men claiming these ailments were based on a dislike of oil of wintergreen, which is added to the cutting oil.

OXIDE UNIT

One operator in the Oxide Unit also claimed poisoning which was showing up in a rather severe case of dermatitis. After due investigation by our Medical Department, the dermatitis turned out to be fungus of a non-occupational origin.

PHYSICAL STRESS

An improved delivery system by the Storeroom, which has reduced the lifting and handling done by production operators, has been devised. This system now delivers drums on pallets or on unloading racks, whichever suits the production unit most conveniently.

A drum unloader, which minimizes back strains and spillages, has been purchased by the Chemical Shipping Department. It features a hydraulic method of raising and tilting a filled drum in order to unload its contents.

A trackmobile has been purchased by the Shipping Departments to reduce physical exertion in the movement of railroad cars.

PERIODIC AIR SAMPLING - Mercury, carbon monoxide, aromatic hydrocarbons

Frequent aromatic hydrocarbon, carbon monoxide, and mercury vapor determinations have been made in several plant locations. Where mercury is used, emphasis has been placed on good housekeeping.

EDUCATIONAL

Topics of the Month- in September the plant-wide safety topic of the month was Noise and Ear Protection. October had as a topic Your Health, which was based on the theme "A Healthy Man is a Safe Worker". Outlines of the subjects were given to the safety meeting chairmen.

WHITING PLANT

Information about the industrial hygiene activities at the Whiting Plant was submitted by Mr. G. J. Klebs, as follows:

NOISE

During 1954, prior to the building of the Polyethylene Unit, a noise survey of the plant was conducted. A consciousness to the possibilities of excessive noise and related potentials has resulted in continued efforts to control or maintain safe levels or to provide personal protection if needed. Among sizeable projects since then completed, or in process of completion, are the erection of a sound-conditioned control room at the Gas Cracking Furnace Unit, revised shaker equipment in the Polyethylene Unit, and the construction of an audio testing room.

In December, 1961, a new plant-wide noise exposure survey was made with the assistance of Mr. N. H. Ketcham. This study included octave-band frequency analyses and estimates of personnel exposure times in the varying noise conditions. A report of this work is now being written by Mr. Ketcham.

RADIATION

Review and discussion was held by Mr. N. H. Ketcham and Mr. C. A. Smith concerning Atomic Energy Commission license requirements for testing and reporting in connection with instrumentation utilizing radioactive materials.

MERCURY - DRIPOLENE

Review and exploratory discussion have been conducted on the subject of mercury vapors and the recycled water skimming basin in the Gas Department.

TEXAS CITY PLANT

The following information was supplied by Mr. W. L. Pegues.

MERCURY CONTAMINATION IN PLANT EFFLUENT

The Vinyl Chloride Unit and Plant effluents were again analyzed for mercury contamination during catalyst change at the Vinyl Chloride Unit.

NOISE

Environmental noise levels were determined at several locations in the plant.

ETHYLENE OXIDE IN AIR

Additional sampling and analyses were made at several locations in the oxide units for ethylene oxide concentrations in air.

COMMUNITY AIR POLLUTION PROBLEM

Periodic determinations were made of SO₂ in fume that originates in a neighboring plant and blankets the southeast portion of our plant occasionally.

IPP CATALYST

The possibility of phosgene production during laboratory synthesis of isopropyl peroxydicarbonate was investigated.

REMOVAL OF H₂S AND BENZENE VAPOR FROM H₂S SCRUBBER

Several checks were made at the time of iron oxide-woodchip removal from H₂S scrubbers to show the effectiveness of an improved pre-entry treatment. Volatile compounds were removed satisfactorily.

COBALT ANALYSES OF URINE SPECIMENS

Analyses of specimens from 54 Oxo Unit employees were begun near the end of 1961 and completed after the first of 1962. Analyses were in duplicate.

SEADRIFT PLANT

The following information about the continuing noise reduction efforts at the Seadrift Plant was supplied by Mr. J. H. Hill.

NOISE

An evaluation of the revised air compressor muffler installations completed in September shows an average over-all reduction in sound pressure level of three decibels. A three decibel rise was noted in the 20-75 octave, and an average drop of 6.5 decibels in the next three octaves. The installation was considered successful.

Preliminary readings for evaluating inspirator mutes in the Olefins No. 1 Furnace Building have been completed.

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