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INDUSTRIAL RELATIONS

INDUSTRIAL HYGIENE SUMMARY REPORT

PERIOD JANUARY 1 - JUNE 30, 1962

PLAINTIFF'S EXHIBIT
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UC-2011

The growing competence of the industrial hygiene programs conducted by the plants and the Technical Center makes possible a simplification in the periodic Company-wide reporting of the work. Because the full-time programs are well established and functioning effectively on a daily basis, the reports of their work are of interest mainly to supervision at the location where the work is being done. Thus, to conserve the time of many of the readers of this periodic Company summary report, only brief reference to the most significant developments will be included.

Some readers need to receive detailed information on the industrial hygiene work being done in all of the Company locations. For these persons, copies of the complete summary reports prepared at each location are attached. In addition, this information will be supplied to others requesting it.

The following activities have been selected as being of particular interest or significance. Almost invariably the prime stimulus for the work is the protection of our own employees at the locations in question. It is notable, however, that in many instances the knowledge and experience gained is also useful to the customer who buys the product and needs to know how to protect the health of his workers. Utilization of this accumulated industrial hygiene experience by our market-oriented business departments is anticipated.

Scheduled pilot-scale production of both solid and liquid rocket fuels involve major potential health problems. Thorough medical and industrial hygiene coverage is mandatory under the terms of the contracts. Because of the highly toxic nature of some of the materials being handled, this service would have been provided in any event as a part of our usual program to protect employees from health hazards.

An experienced industrial hygienist, Mr. Fred Williams, has been added to the staff of the Technical Center Medical Department. Mr. Williams transferred from the Y-12 Plant of the Nuclear Company, bringing with him pertinent specialized experience in the fields of rocket fuels and radioactive materials.

New agricultural chemicals of increased toxicity, which require carefully planned health protection effort, are being handled in larger numbers. Minor illnesses resulting

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from formulating Compound 10854 at the Technical Center dramatically illustrated the need for improved facilities for processing these materials. A new formulation laboratory is now under construction. Experience gained in the safe handling of the new agricultural chemicals will be valuable when the products go into large-scale production and are marketed.

Evaluation of the effectiveness of respiratory protection for employees working in high concentrations of SEVIN dust has been undertaken as a joint effort of the Institute Plant and the Research and Development Department.

Anticipation of production of dicobalt octacarbonyl in Texas City Plant equipment required the development of information on certain of the health and safety hazards inherent in such work. In addition, the possible presence of small amounts of highly toxic nickel carbonyl as a contaminant in the product has been called to our attention by a potential customer.

Solution of a sales problem involving flexible foam products was enhanced by studies showing that the selected volatile organometallic additive could be used without health hazard to the formulators. This was demonstrated by means of air samples taken in the working environment, analyses of urine specimens from employees working with the process, and animal studies conducted by the Chemical Hygiene Fellowship at Mellon Institute.

On July 1, 1962, the State of California took over from the Atomic Energy Commission the responsibility of licensing and inspection of radioactive materials and radiation-producing equipment. Some of the other states are also preparing to do this. Our existing radiation protection programs are in a position to assure compliance with any changes or additional requirements this may impose. If the California law is representative, state control will be no less, and perhaps more, thorough than the AEC control. The California regulation calls for registration, periodic inspection, and payment of a license fee for each radiation source.

A laboratory service of the Research and Development Department in support of the plant and Technical Center industrial hygiene programs was transferred to the supervision of Mr. N. H. Ketcham on May 1, 1962. This will facilitate close coordination between this laboratory activity and the industrial hygiene consulting service which has been available for many years. The adaption or application of known instrumental and analytical procedures for industrial hygiene use will be one important part of the laboratory service In addition, specific help in the measurement and evaluation of health hazards in the working environment will be given to the Company locations which do not require a full-time industrial hygiene program.

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The South Charleston Plant is using a revised "Hazardous Work Permit" which includes information relating to radioactive sources, potential toxicity hazards, and special ventilation requirements. It is felt that this revised Permit has increased the safety with which certain jobs are performed and has led to the recognition of a number of new problems, especially involving contamination of air with gases and vapors.

N. H. Ketcham

N. H. Ketcham
Industrial Hygiene Consultant

NHK/dww
9-26-62
Attachments*

*See attached distribution list

DE 005081

DISTRIBUTION

* Recipients identified with an asterisk after their name receive copies of the complete reports prepared at the locations having full-time industrial hygiene programs.

Business Department Managers
- Mr. F. H. Belden
- Mr. A. B. Burns
- Mr. R. W. Eddy
- Mr. K. J. Gutshaw
- Mr. M. Hill
- Mr. R. W. King

Brownsville Plant
- Mr. H. B. Coons
- Mr. W. E. Warren*

General Safety and Fire Protection Department
- Mr. V. V. Tilton*

Technical Service Laboratory
- Dr. A. B. Steele

Institute Plant
- Mr. F. D. Bess
- Mr. L. N. Dickinson
- Mr. S. C. Giambruno
- Mr. R. A. Huber
- Mr. R. E. Peele*
- Mr. E. W. Poinier, Jr.*
- R. J. Sexton, M. D.*

Mellon Institute
- Dr. C. P. Carpenter*
- Dr. H. F. Smyth, Jr.*

New York Offices
- Dr. R. L. Bateman
- C. U. Dernehl, M. D.*
- Mr. J. S. Freeman
- Dr. J. L. Marsh
- Mr. P. W. McDaniel*
- Mr. A. P. Moss
- Mr. O. C. Thompson (Bldg. 82)

Niagara Falls Plant
- Mr. D. M. Rupert

Seadrift Plant
- Mr. R. P. Barry
- Mr. A. E. Bransford*
- Mr. J. H. Hill*
- Mr. J. J. Walthall

Torrance Plant
- Mr. W. E. Knight*
- Mr. J. T. McClure
- Mr. C. N. Rucker

Texas City Plant
- Mr. H. E. Allspach
- Mr. O. T. Carlisle*
- R. E. Joyner, M. D.*
- Mr. W. J. Suiter

Whiting Plant
- Mr. G. O. Bunch*
- Mr. J. M. Elliott
- Mr. P. C. Kelly
- Mr. G. J. Klebs*
- Mr. C. A. Smith

South Charleston Plant
- Mr. M. A. Aitken
- Mr. H. L. Babcock
- Mr. E. E. Buxton
- Mr. B. R. Harper
- Mr. W. F. Hartling
- Mr. R. C. Hieronymus
- E. Q. Hull, M. D.*
- Mr. R. J. Murphy
- Mr. B. L. Murray*
- Mr. L. A. Roebke*
- Mr. W. W. TenEyck

Technical Center
- Mr. R. M. Berg
- E. M. Best, Jr., M. D.*
- Mr. J. W. Biddle
- Mr. J. D. Cavender*
- Mr. P. W. Gregory, Jr.
- Mr. E. C. Harry
- Dr. F. Johnston
- Mr. W. A. Katholi
- Dr. J. V. Murray
- Mr. J. W. Perry
- Dr. B. Phillips
- Mr. S. H. Rose, Jr. (2)
- Mr. H. T. Sessions
- Mr. Fred Williams*

DE 005082

INSTITUTE PLANT

512 INDUSTRIAL HYGIENE ACTIVITIES

1 February 1962 - 1 July 1962

I. Investigations

A. Physical Stresses

1. Noise

a. The two pump houses, located on the river, were visited and examined with note being made of the existence of noise levels that could be classified as disturbing to hearing. This condition will be thoroughly evaluated in the near future.

b. One of several visits to the Fluorocarbons Shipping Building disclosed the existence of a potentially hazardous noise condition in existence on each of two air instruments. Unmuffled exhaust ports undoubtedly served to produce the excessive noise. Noise level measurements will soon be conducted.

B. Chemical Stresses

1. Dust

a. Complaints of disturbing dusty conditions, in existence on the second floor of the Fluorocarbons Shipping Building, were investigated and found to be warranted. However, an evaluation of the atmospheric conditions was not deemed necessary when it was determined that the dust was not in itself harmful to health and that the problem could be easily relieved through the installation of a small vent line to the outside.

2. Gases

a. Detector tubes are still being used at regular monthly intervals in revealing an indication of the HCN concentrations present in various areas of the Hydrogen Cyanide Unit.

b. Complaints of hazardous gas conditions in existence over the Fluorocarbon Units "HCl Leaching Pit" were investigated. Carbon monoxide and hydrogen sulfide concentrations were measured with detector tubes and found to be of such sufficient volume as to warrant further more extensive evaluation. Preparations for the initiation of such a program are now under way.

3. Vapors

a. A request for assistance by the Safety Department, in uncovering a safe substitute solvent for use in the Safety Supply Room disclosed the existence of a completely ineffective exhaust system and a hazardous working condition as produced by the use of a combustible solvent. Temporary relief and protection was realized after substituting a safe solvent for use and then utilizing an available washing machine for difficult scrubbing problems such as clothing contaminated with

1-Naphthol deposits. Further investigation into this exhaust system is scheduled for the near future.

b. Routine monthly surveys of the benzene concentrations in air in the #1 and #2 Styrene and Gas Separation Units continue to be conducted, with the result that some desire has been expressed to discontinue the sampling program in the Gas Separation Unit. Thorough analysis of all existing data is being conducted so as to clarify the status of the program.

c. Infrared instrumental techniques are being utilized in an endeavor to establish the connection, if any, between the concentrations of toluene vapors present in the finished "SEVIN Insecticide" product and the production of several cases of illness as experienced by laborers packaging the material by hand. The same technique is also being applied in relation to another case of possible over-exposure to toluene as revealed in the paint spraying area of the Fluorocarbons Shipping Building.

d. Monthly sampling for acetonitrile vapor concentrations in air are still being conducted in various locations of the Fiber T Unit.

C. Air Pollution

1. Regular collection and analysis of fly ash concentrations as obtained from various sites within the plant, in Nitro, and in St. Albans are still being routinely conducted each month.

II. Investigations and Evaluations

A. Physical Stresses

1. Noise

a. Objectionable noisy working conditions, in existence in Room 228 of the Plant Laboratory, were investigated as requested by Mr. R. L. McNeer. All physical noise measurements were obtained through the cooperative efforts of Mr. E. C. Harry and his Olefins Engineering Staff. A complete evaluation of this data is expected to be soon received from this group and recommendations will then be forthcoming.

b. A report of objectionable noisy working conditions in existence in Room 6 (the I.B.M. Key Punch Room) of Building 2, as received from Mr. C. O. Crawford of the Safety Department, was also investigated with the help of Mr. E. C. Harry's staff. Physical noise measurements were obtained at this time and a complete evaluation of all data is expected to be soon received. Recommendations will follow.

2. Radiation

a. Shortly after the addition of a new X-ray Spectrograph to the Plant Laboratory's inventory of fine instrumental equipment, Mr. F. L. Boggs submitted a request for an evaluation of the hazard to health (if any) experienced by any individual employed in working with such instruments. An Industrial Hygiene Radiation Survey of the problem was conducted as requested and a report of all findings, complete with recommendations, will soon be submitted.

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3. Lighting

a. Measurements of the illumination in all areas of the Dispensary were obtained as requested by Doctor Sexton just prior to and following a service and maintenance check of the lamps and fixtures. This data was drawn up and submitted to him for future use.

B. Chemical

1. Dust and Fumes

a. Atmospheric dust samples of the "'SEVIN' Insecticide dust in air" concentrations continue to be taken at the "SEVIN" Unit. Errors were uncovered in the sampling methods as used in the past with the result that a new collection and analysis procedure is now being employed. This new method was adopted from a proven procedure utilized by the Analytical Laboratory in their "SEVIN" work and it is hoped that it will serve as a dependable replacement for the old method. This adaptation was made possible only through the cooperative efforts of Mr. W. C. Ross, Mr. W. E. Bird, and Mr. P. F. Jenkins.

b. Questions relative to the health hazard of two inhibitors used at the Acrolein Unit, i.e., hydroquinone and phenothiazine, led to the initiation of an unsuccessful attempt to sample and evaluate the hydroquinone concentrations in air. The problems encountered in the analytical method have been corrected and plans for further study into this problem both at the Acrolein Unit and the new Acrylic Esters Unit are now in the making.

c. Chromium exposures in existence, in the #1 Catalyst Unit, have been initially re-evaluated, however, these findings will not be submitted in the form of a report until a second sampling program has been completed.

2. Gases and Vapors

a. Nitrogen dioxide exposures in existence, in the #1 Catalyst Unit, have been initially re-evaluated; however, these findings will not be submitted in the form of a report until a second sampling program has been completed.

b. Numerous complaints of the existence of disturbing concentrations of ammonia vapors in air in the Office Building promoted a short investigation into the problem of where, why, and how the material is released. A report will soon be forthcoming on this matter.

c. The periodic six-month check of 1-Naphthol vapor concentrations in air in the 1-Naphthol Department of the "SEVIN" Insecticide Unit has been completed and a report is soon to be released relating the findings.

d. Atmospheric mercury vapor concentrations have been evaluated in one section of the Laboratory. This investigation was conducted by Mr. A. Barthelmess through the use of a newly acquired "Beckman Mercury Vapor Meter".

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C. Ventilation

1. The recent acquisition of very sensitive air measurement instruments, i.e., the "Anemotherm Air Meter", made it possible to obtain valuable data on the efficiency of ventilation systems in three different areas of the plant.

a. Velocity measurements were obtained on the paint spray booth located in the Fluorocarbons Shipping Building. A report of this investigation will be submitted in the very near future.

b. Velocity measurements were obtained on the exhaust system in use at the #1 Catalyst Unit. This data was submitted directly to Mr. C. D. Miller for his direct use.

c. Velocity measurements of the Dispensary Building's ventilation system revealed a complete lack of air movement. It was later disclosed that this deficiency resulted from the presence of excessive quantities of materials deposited on the fan blades and on the screen attached to the exhaust end of the duct work. This problem is now being corrected and further measurements will be obtained when corrections have been completed.

III. Investigations, Evaluations, and Recommendations

A. Physical Stresses

1. Noise

a. Two noise surveys of the Acetone Unit were conducted and reported on. In the first case, the entire unit was evaluated in relation to the "Hazard to Hearing" of one operator. In the second case one specific type of noise, i.e., that being produced once a week for continuous periods of about 36 hours, during periods of "Catalyst Reactivation", was evaluated. This problem has been corrected.

b. The entire "Gas Cracking and Compression Departments of the Olefins Area" was surveyed and evaluated for hazards to hearing. This included each of the four separate buildings which comprise the Gas Cracking and Compression Departments, i.e., Gas Compression, Furnace, Air Compression, and Wulff Furnace. All data, evaluations, and recommendations were submitted to all concerned persons in final report form with each hazardous area being identified.

c. The new "Oxygen Plant" was evaluated throughout for all hazards to hearing. All data, evaluations, and recommendations were then submitted to concerned persons in a final report form with each hazardous area being identified.

d. The #1 Dowtherm Unit was surveyed for hazard to hearing of all persons working around and on the furnaces. All data, evaluations, and recommendations were also submitted in final report form to all concerned personnel, with each hazardous area being identified.

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e. A joint "Acoustical Survey" of the Plant Cafeteria was conducted with members of Mr. E. C. Harry's Olefins Engineering Staff. A report of all findings and recommendations was submitted in its final form and corrections were soon partially initiated and the remainder will be completed in the near future. After completion, further measurements will be made.

2. Radiation

a. A routine six-month follow-up survey of one Strontium-90 sealed source was conducted and reported on in accordance with both the A.E.C. and Company requirements.

3. Lighting

a. A lighting problem in the Plant Mail Room was investigated, evaluated and reported on. The problem, stemming from the intense lighting system used on a "XeroX" machine, has been corrected in accordance with submitted recommendations.

B. Chemical Stresses

1. Dust

a. A second dust survey was conducted in the Construction Insulation Fabrication Shop for the purpose of evaluating three new insulation materials. These materials were produced by the Johns Manville Company as possible substitutes for their "Thermobestos" material which had been condemned by an earlier survey as being hazardous to health when processed with band saws. All data, evaluations, and recommendations were submitted to concerned persons in a final report form revealing the inadequacies of the material in relation to health.

C. Miscellaneous

1. The protective clothing program in use at the Coal Hydrogenation Unit was evaluated at the specific request of Mr. D. G. Hulett. This evaluation was actually carried out by examining all clothing for any fluorescent contamination with an ultraviolet lamp and then by comparing all findings in accordance with predetermined procedures. A report of all data, complete with recommendations, was issued to all concerned persons.

2. A resumé of the toxic properties and recommended safe handling procedures for "Dibutyl Carbitol" was submitted to Mr. Thomas B. Howard, Jr. (an employee of the Electron Tube Division of R.C.A.).

3. A resumé of the toxic properties and possible safe handling procedures for both "Hydroquinone" and "Phenothiazine" was submitted to Mr. P. G. Schrade upon request. Mr. Schrade was, at this time, assigned to the Acrolein Unit.

4. Mr. J. B. Chenoweth, Safety Director for Goodrich Gulf Corporation, was introduced to our benzene sampling program and our philosophy in relation to this problem. This was conducted in an effort to help Mr. Chenoweth in his approach to a new problem at his plant.

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5. An explanation of industrial hygiene, i.e., what it is, where it is used, why it is needed, and how it is carried out, was given during an orientation meeting for newly-hired technical personnel in conjunction with an explanation of the Toxicology Program given by the Plant Medical Director.

6. A resumé of an "Industrial Defense Course" given at the Technical Center by Mr. A. L. Keyser, of the W. Va. Department of Civil Defense, was submitted to all interested persons.

7. Minutes of an Industrial Hygiene Seminar on Noise, as conducted at the Technical Center by Mr. N. H. Ketcham, were submitted to all interested persons.

IV. Projects to be Instituted

A. Physical

1. Noise

a. A complete evaluation of the noise problem in Construction Shops.

b. An evaluation of the noise problem at the Glycol Unit.

c. An evaluation of the noise problem in the Maintenance Welding Shop.

d. An evaluation of the noise problem in Fluorocarbons Shipping.

B. Chemical

1. Dusts and Fumes

a. An evaluation of safe respirators for use in atmospheres contaminated with "SEVIN" Insecticide dust.

b. An evaluation of the hazard to health at the Acrylic Esters Unit resulting from the handling of three inhibitors, i.e., hydroquinone, monomethyl hydroquinone, and phenothiazine.

2. Gases and Vapors

a. An extensive sampling program for the evaluation of the benzene exposure at the Coal Hydrogenation Plant.

b. An evaluation of the hazard to health resulting from ammonia exposure in the Mailroom.

c. A study of the vanadium pentoxide hazard at the Phthalic Anhydride Unit.

d. An evaluation of mercury vapor hazard in the Maintenance Instrument Shop and the Works Laboratory.

e. An evaluation of the phenol, acrolein, TDI, trichloroethylene, and propylene oxide hazard at the Polyols Unit.

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C. Ventilation

a. An evaluation of the ventilation system in the Works Laboratory.

b. An evaluation of the ventilation system installed on the "SEVIN" Insecticide bagging equipment.

c. An evaluation of the exhaust facilities in the Safety Department's Supply Room.

D. Air Pollution

a. An evaluation of all accumulated sampling data.

Submitted by: R. E. Peele

R. E. Peele
Industrial Hygienist - Plant 512

REP:gl

27 August 1962

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