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PLAINTIFF'S EXHIBIT

UC-4917

WALK-THRU SURVEY REPORT
of
UNION CARBIDE CORPORATION
at
KING CITY, CALIFORNIA

Survey Conducted by:
Thomas C. Cooper
William N. McKinnery, Jr.
Charleston C. K. Wang

Date of Survey:
August 5, 1982

Report Written By:
Thomas C. Cooper

Date of Report
October, 1982

Mining and Minerals Section
Engineering Control Technology Branch
Division of Physical Sciences and Engineering
National Institute for Occupational Safety and Health

Cincinnati, Ohio

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PURPOSE OF SURVEY:	To perform a preliminary survey of the Asbestos Bagging Operations at Union Carbide's Asbestos Mill.
ADDRESS OF PLANT:	Union Carbide Corporation P. O. Box K King City, California 93930
EMPLOYER REPRESENTATIVES:	John L. Myers, Product and Production Manager-Asbestos R. J. (Bob) Kronkhyte, Mill Foreman/Safety Engineer B. E. (Bill) Usrey, Assistant Mill Foreman R. O. (Dick) Marsten, Mine Superintendent/Plant Engineer
EMPLOYEE REPRESENTATIVES:	None
STANDARD INDUSTRIAL CLASSIFICATION:	SIC ~~3292~~ 1499)
ANALYTICAL WORK:	None

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ABSTRACT

A preliminary survey was conducted at Union Carbide Corporation's chrysotile asbestos milling operation near King City, California, in conjunction with a NIOSH study evaluating measures used to control occupational health hazards associated with packaging processes used for dry materials. The company has several engineering controls: enclosures under negative pressure, automatic palletizing, and the use of stretch and shrink wrap. All of these are considered to be exemplary. An in-depth study at this operation is recommended.

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I. INTRODUCTION

The Engineering Control Technology Branch of the Division of Physical Sciences and Engineering, NIOSH, is conducting a research study to assess and document exemplary technology available for the control of airborne dust in dry material bagging operations. The control technology studies will be described in sufficient detail to allow the information to be used to prevent or reduce the generation and transmission of dust in similar operations. The results of the assessment will be disseminated in a manner that will maximize the application of demonstrated control technologies in the workplace, without disclosing proprietary information in any manner.

A survey of the packaging (bagging) operations at King City was conducted to determine the suitability of this location for an in-depth study. Engineering control technology observed included engineering controls, work practices, and protective equipment. Union Carbide has several types of controls considered to be exemplary and its asbestos mill is recommended for an in-depth survey.

II. PLANT DESCRIPTION

Union Carbide produces a short fiber asbestos product which is used in a variety of applications. The site consists of one processing building, maintenance and office facilities, and two covered storage areas. The packaging operations are located in the processing building and were the areas of interest in this survey. This two story building (steel frame with metal sides) has a concrete floor, no basement, and approximately 20,000 square feet of floor space. There are two separate packaging areas, each with a conveyor and palletizing area. The grounds surrounding the building are paved, including areas under the various ancillary structures.

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The asbestos mill has a work force of under 100 employees. The plant started production in 1963 and presently transports 80% of the product in bags and 20% in bulk railcars.

III. PROCESS DESCRIPTION

Ore is transported about 60 miles from a massive short fiber chrysotile asbestos deposit located near Coalinga, California. Ore from the stockpile at the mill is slurried, crushed, sized, screened, dewatered, pelletized and dried. A portion of the product is sold in pellet form and is shipped by either bulk or in bags. The remaining pellets are further processed through a hammer mill to produce open fibers which then are packaged and shipped.

Packaging is performed in two separate areas of the plant. The "Main Bagger" has three packing stations: two single spout force flow packers, and one single spout auger packer. The second bagging area, "RG-244 Bagger", has one single spout force flow packer. All four packers are manually operated.

Three general types of bags are used: plastic valve bags, paper pasted valve bags, and hand tuck valve bags designed to hold 10 to 82 pounds of product. At the "Main Bagger", a bag is placed on the spout, filled, and dropped from the packer onto a chain conveyor. The filled bag passes through a bag flattener and onto other conveyors leading to an automatic palletizer. From the palletizer, a forklift takes the loaded pallet to the stretch wrapper and then on to storage until shipped. Plastic and paper bags are used at the "Main Bagger." Papar bags are individually shrink wrapped.

At the "RG-244 Bagger", the packer is enclosed in a hood. The paper bag is placed on the packer spout; and, as it starts to fill, the door to the hood is closed. Low pressure, 3 to 5 psi, is used to fill the bags. After the bag is filled, the door is opened, bag removed by hand and set on a chain conveyor. The bags pass through a bag

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flattener and each bag is shrink wrapped. The bags proceed to the palletizing area (different than for the "Main Bagger") and are hand palletized. The loaded pallets are moved by forklift to either the stretch wrap station or to storage.

The main packaging crew consist of one bagger operator and one palletizer operator. The RG-244 operation has only a bagger operator. Laborers are used for transporting loaded pallets to storage. Packaging is normally performed 3 shifts per day, 5 days per week.

IV. DESCRIPTION OF PROGRAMS

All employees are required to have pre-placement and periodic medical examinations which include a pulmonary function test, chest X-rays, sputum cytology, etc. The examinations are performed at a local clinic; and doctors have reported no asbestos-caused pulmonary damage to employees, whose average length of employment at the mill is over 10 years. Periodic air monitoring is performed on selected employees in selected areas. Personal protective equipment required includes respirators, hard hats, safety glasses, coveralls, ear protectors, and safety shoes. No smoking is permitted on the property and employees are encouraged not to smoke at any time. Safety training is conducted pursuant to MSHA requirements and housekeeping is performed continually, emphasizing prompt cleanup of spills.

V. SAMPLE DATA FROM PRELIMINARY PLANT SURVEY

No samples were taken.

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VI. DESCRIPTION OF CONTROL STRATEGY FOR THE BAGGING OPERATIONS

Union Carbide has engineered controls around each packaging station, such as exhaust ventilation and enclosures for parts of the bag handling system. Each packer unit has its own dust collector. At the "Main Bagger", there are three packers. The bulk of the packers, packer spout and the bag being filled, are located within a common enclosure that is under negative pressure. Also, the conveyor between the packer and bag flattener as well as the bag flattener are located within this enclosure. In the floor of this enclosure, there is a ditch with scraper paddles and water sprays to remove any spilled product, discharging it into the wet feed circuit. A similar enclosure for the bag flattening and the conveyor feeding the flattener is located in the "RG-244 Bagger" area. At this packer, an enclosed hood with the door closed is used as the bag is being filled.

Both plastic and paper bags are used to package the product. When paper bags are used, each bag is individually shrink wrapped. Pallet loads, whether of plastic bags or shrink wrapped paper bags, are stretch wrapped before shipment. In the area of housekeeping, a central vacuum system portable vacuum cleaners and wet washing are used to clean the floors each shift and to periodically clean the rafters. Also, a vacuum sweeper and water truck are used on the grounds surrounding the buildings and the parking lot.

Other controls used at the mill site include the use of water, without binders, to control the dust on the ore stockpile; installation of lead filled vinyl curtains around the vertical grinders for both dust and noise control; wet ore beneficiation and product pelletizing, which afford better dust control as well as processing advantages; and one man on the site to do fiber counts, thereby speeding up the returns on the air monitoring samples.

Because of the controls described above, airborne asbestos concentrations in all mill areas are normally below the current standard of 2 f/cc. Respirators are required in locations where this level may be exceeded.

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VII. CONCLUSIONS AND RECOMMENDATIONS

There are several engineering controls worth an in-depty study. These include the enclosures under negative pressure between the packer and past the bag flattener, the enclosed capture hood for the "RG-244 Bagger", shrink and stretch wrapping operations, and automatic palletizer. Union Carbide has designed some of these and other controls to reduce asbestos exposures to the worker and preclude emissions to the environment.

It is recommended that this plant be considered for an in-depth survey.

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WCK - Report attached.

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and provided to BLS by 18 States: Alaska, Arizona, California, Colorado, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New Mexico, Ohio, Oregon, Tennessee, and Wisconsin. Included are data on characteristics of injuries or illnesses (Nature, Part of Body, and Source) and the accidents or exposures which produced them (Type and Associated Object or Substance), industry, occupation, age, and sex of the injured or ill employee, month and day of the injury or illness, hour of shift of the injury, duration of employment and weekly wage of the employee, and kind of insurance coverage carried by the employer. Data represent 1980 cases involving death, permanent disability, or temporary-total disability of a specified minimum number of days for each State.

Occupational Injuries and Illnesses, Closed Cases, 9 States, 1980.
Bureau of Labor Statistics, Washington, DC. 1983, 2882p
BLS/SDS/GP3-80 Microfiche copies only (Fourteen sheets 42X reduction).
PB83-172239 Price code: MF E02

Microfiche of Standard Tabulations produced by the Supplementary Data System (SDS). These microfiche contain 72 tabulations of occupational injury and illness data classified and provided to BLS by 9 States: Arkansas, Colorado, Delaware, Idaho, Montana, New York, North Carolina, Washington, and Wisconsin. Included are data on characteristics of injuries or illnesses (Nature, Part of Body, and Source) and the accidents or exposures which produced them (Type and Associated Object or Substance), industry, occupation, age, and sex of the injured or ill employee, day of the injury or illness, duration of employment and weekly wage of the employee, and the extent of disability, indemnity compensation, and medical payments associated with the injury or illness. Data represent cases closed during 1980 involving death, permanent disability, or days of disability sufficient to result in the payment of indemnity compensation. Some states also provide cases involving only medical treatment.

Walk-Thru Survey Report of the Hammond Lead Products, Inc., Lead Pigments and Chemicals at Hammond, Indiana.
Thomas C. Cooper, and Frank W. Godbey.
National Inst. for Occupational Safety and Health, Cincinnati, OH. Engineering Control Technology Branch. Jun 82, 9p
PB83-243469 Price code: PC A02/MF A01

NIOSH studies have demonstrated a need to examine the packaging processes used for dry chemicals. A large number of workers in a variety of industries are involved in packaging processes. The monitoring, work practices, and personal protective equipment used by Hammond Lead Products, Inc. shows a potential for reducing the lead exposure to workers until improved engineering controls can be implemented. An in-depth study in the bagging area is a possibility.

Walk-Thru Survey Report of Union Carbide Corporation at King City, California.
Thomas C. Cooper, William N. McKinnery, Jr., and Charleston C. K. Wang.
National Inst. for Occupational Safety and Health, Cincinnati, OH. Engineering Control Technology Branch. Oct 82, 10p
PB83-243485 Price code: PC A02/MF A01

A preliminary survey was conducted at Union Carbide Corporation's chrysotile asbestos milling operation near King City, California, in conjunction with a NIOSH study evaluating measures used to control occupational health hazards associated with packaging processes used for dry materials. The company has several engineering controls: enclosures under negative pressure, automatic palletizing, and the use of stretch and shrink wrap. All of these are considered to be exemplary. An in-depth study at this operation is recommended.

Preliminary Site Survey Report on Frit Bragging Operation at Chi-Vit Corporation, Urbana, Ohio.
Thomas C. Cooper, and C. K. Wang.
National Inst. for Occupational Safety and Health, Cincinnati, OH. Engineering Control Technology Branch. Jul 82, 13p
PB83-243493 Price code: PC A02/MF A01

A preliminary survey was conducted at Chi-Vit Frit manufacturing operation near Urbana, Ohio in conjunction with a NIOSH study evaluating measures used to control occupational health hazards associated with the packaging processes used for dry chemicals. A large number of workers in a variety of industries are involved in the packaging process. The company has several engineering controls (bag opening and empty bag disposal practices, ventilation at each batching bin, and location of the dump car tunnel) considered to be exemplary. An in-depth study at this operation is recommended.

Bibliography of Coefficient of Friction Literature Relating to Slip Type Accidents.
James M. Miller.
Michigan Univ., Ann Arbor. Dept. of Industrial and Operations Engineering. Feb 83, 15p IOE/CE-83/01
PB83-243626 Price code: PC A02/MF A01

In the bibliography contained herein, this author has compiled a list of references which address various aspects of coefficient of friction (COF) as it relates to slip type accidents. Included are topics such as friction measurement machines, floor slipperiness, shoe sole COF values, and required COF for walking and a few work type tasks. The references were collected as cited from among over thirty-five notable publications which have appeared over the past fifty years. The result is over three hundred references originating from books, periodical articles, technical reports, proceedings, and standards.

Walk-Thru Survey Report of Calaveras Asbestos Ltd. at Copperopolis, California.
Thomas C. Cooper, William N. McKinnery, Jr., and Charleston C. K. Wang.
National Inst. for Occupational Safety and Health, Cincinnati, OH. Engineering Control Technology Branch. Oct 82, 9p
PB83-243824 Price code: PC A02/MF A01

A preliminary survey was conducted at Calaveras Asbestos Operation near Copperopolis, California in conjunction with a NIOSH study evaluating measures used to control occupational health hazards associated with the packaging processes used for dry chemicals. A large number of workers in a variety of industries are involved in the packaging process. The company has several engineering controls (packaging system, automatic palletizer, use of shrink wrap, ventilation controls during fiber processing, and housekeeping practices) considered to be exemplary. An in-depth study at this operation is recommended.

Walk-Thru Survey Report of the Minerals Division/Grefco, Inc., Lompoc, California.
Thomas C. Cooper, William N. McKinnery, Jr., and Charleston C. K. Wang.

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