PRELIMINARY SURVEY REPORT:

CONTROL TECHNOLOGY FOR FILLING OF CONTAINERS

AT

Alchem-Tron
Cleveland, Ohio

REPORT WRITTEN BY:
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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
Division of Physical Sciences and Engineering
Engineering Control Technology Branch
4676 Columbia Parkway
Cincinnati, Ohio 45226

PLANT SURVEYED:	Alchem-Tron 7415 Bessemer Cleveland, Ohio 44127 (216) 441-5628
SIC CODE:	4953
SURVEY DATE:	December 10, 1985
SURVEY CONDUCTED BY:	Thomas C. Cooper
EMPLOYER REPRESENTATIVES CONTACTED:	Robert Otto, Maintenance Foreman
EMPLOYEE REPRESENTATIVES CONTACTED:	No Employee Representative

I. INTRODUCTION

The National Institute for Occupational Safety and Health (NIOSH) is the primary Federal agency engaged in occupational safety and health research. Located in the Department of Health and Human Services (formerly DHEW), it was established by the Occupational Safety and Health Act of 1970. This legislation mandated NIOSH to conduct a number of research and education programs separate from the standard setting and enforcement functions carried out by the Occupational Safety and Health Administration (OSHA) in the Department of Labor. An important area of NIOSH research deals with methods for controlling occupational exposure to potential chemical and physical hazards. The Engineering Control Technology Branch (ECTB) of the Division of Physical Sciences and Engineering has been given the lead within NIOSH to study the engineering aspects of health hazard prevention and control.

Since 1976, ECTB has conducted a number of assessments of health hazard control technology on the basis of industry, common industrial process, or specific control techniques. Examples of these completed studies include the foundry industry; various chemical manufacturing or processing operations; spray painting; and the recirculation of exhaust air. The objective of each of these studies has been to document and evaluate effective control techniques for potential health hazards in the industry or process of interest, and to create a more general awareness of the need for or availability of an effective system of hazard control measures.

These studies involve a number of steps or phases. Initially, a series of walk-through surveys is conducted to select plants or processes with effective and potentially transferable control concepts or techniques. Next, in-depth surveys are conducted to determine both the control parameters and the effectiveness of these controls. The reports from these in-depth surveys are then used as a basis for preparing technical reports and journal articles on effective hazard control measures. Ultimately, the information from these research activities builds the data base of publicly available information on hazard control techniques for use by health professionals who are responsible for preventing occupational illness and injury.

This plant was visited as part of a study of dust control during the loading of bulk dry materials into open and closed containers including trucks and railroad cars. The study will evaluate the effectiveness of various control technologies designed to reduce dust exposures to personnel in the bulk loading area. Ultimately, this project will result in a proposed journal article describing the effectiveness of such controls.

II. PLANT AND PROCESS DESCRIPTION

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Alchem-Tron treats hazardous industrial waste at two sites in Cleveland, Ohio. The one site has been treating liquid waste since 1977 and the second site treats solid waste. This solid waste treatment facility (the site visited) has been in operation since 1982. The company moved into existing buildings in 1982, modifying these facilities to meet their needs. This

4.4-acre site consists of the main building housing offices, labs, and maintenance, and ancillary buildings for the treatment of the waste material. This operation is nonunion and has approximately 50 employees.

Industrial waste from throughout the mid-west is treated at Alchem-Tron's two treatment plants. Some types of solid waste use low grade lime as part of treatment. Low grade lime is stored in a 20 feet by 40 feet high silo. As the lime is needed, it is loaded by gravity into the bucket, 1 to 1.5 yard capacity, of a front-end loader and transported in this open bucket a couple hundred feet to the treatment area. All of the neutralized waste is taken to secured landfills. During the site visit, the loading station was not in use for no lime was needed for the waste being treated.

POTENTIAL HAZARDS

The potential hazard from the low grade lime is the production of nuisance dust. Other hazards depends on what is in the waste being treated, products from reactions that may take place during treatment, and end products that may result with some treatments.

III. CONTROLS

PRINCIPLES OF CONTROL

Occupational exposures can be controlled by the application of a number of well-known principles, including engineering measures, work practices, personal protection, and monitoring. These principles may be applied at or near the hazard source, to the general workplace environment, or at the point of occupational exposure to individuals. Controls applied at the source of the hazard, including engineering measures (material substitution, process/equipment modification, isolation or automation, local ventilation) and work practices, are generally the preferred and most effective means of control both in terms of occupational and environmental concerns. Controls which may be applied to hazards that have escaped into the workplace environment include dilution ventilation, dust suppression, and housekeeping. Control measures may also be applied near individual workers, including the use of remote control rooms, isolation booths, supplied-air cabs, work practices, and personal protective equipment.

In general, a system comprised of the above control measures is required to provide worker protection under normal operating conditions as well as under conditions of process upset, failure, and/or maintenance. Process and workplace monitoring devices, personal exposure monitoring, and medical monitoring are important mechanisms for providing feedback concerning effectiveness of the controls in use. Ongoing monitoring and maintenance of controls to insure proper use and operating conditions, and the education and commitment of both workers and management to occupational health are also important ingredients of a complete, effective, and durable control system.

These principles of control apply to all situations, but their optimum application varies from case to case. The application of these principles are discussed below.

ENGINEERING CONTROLS

Engineering controls used during the loading of the lime includes a loading spout and a cover to fit over the front-end loader's bucket. The loading spout is DCL's (Dust Control and Loading Systems) Model 24-8. This $4,000 unit is equipped with 8 feet of vertical travel, automatic level sensor, and is not ventilated. The spout has been in operation for 18 months. Alchem-Tron contracted Robertson Equipment Company in Cleveland to design and install a cover that is fastened to the loading spout which covers the entire open bucket of the front-end loader during loading operations. This cover has been in use for a year. The loading station beneath the storage silo is a 3-sided enclosure for the loading spout and bucket of the front-end loader.

WORK PRACTICES

This loading operation is a one-man operation. The operator positions the bucket of the loader beneath the spout, lowers the spout until the cover sets on the bucket and then fills the bucket. Depending on what type of waste is being treated, the operator may use as many as 10 to 20 buckets of lime a day or he may not use any lime for a 2-week period.

PERSONAL PROTECTION

Personal protective equipment includes hard hats, safety glasses or goggles, and dust mask. Respirators are also available if the worker wishes to use them.

OTHER OBSERVATIONS

During the site visit, no buckets were being filled. However, observed within the enclosure was some lime on the ground do to spillage during loading operations. The driving surface between the loading station and the treatment area is a smooth concrete surface which reduces spillage from the open bucket during transport by the front-end loader.

IV. CONCLUSIONS AND RECOMMENDATIONS

Alchem-Tron feels the controls for dust emissions at the low grade lime loading station met their needs. With the installation of the cover over the front-end loader bucket, another significant source of dust emissions was further reduced. Visual observations of this area indicates this system does substantially control the dust. However, no data are available on the actual dust levels.

Due to the infrequent and irregular use of the loading spout, being dictated by the waste being treated, and the potential hazard at this station being a nuisance dust, this operation is not recommended for an in-depth study.