

MINING HEALTH HAZARD EVALUATION

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Evaluation of Flocculant Agents
Lundale, West Virginia

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PURPOSE

The National Institute for Occupational Safety and Health conducted a Mining Health Hazard Evaluation at The Buffalo Mining Company's No. 5 Preparation Plant, Lundale, West Virginia, Mine I.D. Number 46-02140, on September 22, 1978. The purpose of the survey was to determine if the chemicals used as flocculant agents in the Static Thickener Area and Refuse Filter Area posed an occupational health problem.

DISCUSSION

The preparation plant cleans, sizes, and grades coal received from adjacent mines. Wet separators are used to separate the fine coal and refuse. The chemical flocculants used in the Refuse Filter and Static Thickener Areas are SUPERFLOC 204 and SUPERFLOC 206, respectively.

The chemicals were used in a powder form at the time of the survey. The operator manually used a tin can to scoop out the chemical from the bag. The contents of the can were then poured into a mixing basin through a plastic funnel. No predetermined amount was measured. The chemical was added to the mixing basin until the solution looked right, based on the experience of the operator. No protective equipment was used. From observation, the fans mounted near the funnels were greatly reduced in effectiveness because of the accumulation of dirt on the fan.

The chemicals are manufactured by the American Cyanamide Company. According to the Materials Safety Data Sheets for the chemicals supplied by the company, both products are anionic polyacrylamides with a trace (less than 0.5%) residue of acrylamide. According to current literature findings, polyacrylamides pose little or no health problem to the normal individual through ingestion, inhalation, or skin contact. An article in The Encyclopedia of Chemical Technology (3rd edition, Vol. 1, pg. 202) indicated a skin irritation may occur in some individuals if there is gross contamination. To the best of our knowledge, after researching available information, there is no evidence to indicate that there will be chronic effects associated with the use of SUPERFLOC.

The American Conference of Governmental Industrial Hygienists has not recommended a threshold limit value (TLV) for SUPERFLOC. A TLV has been established for acrylamide of 0.3 milligrams per cubic meter (mg/m^3) of air. However, since the exposure is intermittent and minimal, it is doubtful that a health hazard is present.

CONCLUSIONS

A health hazard did not exist at the coal preparation plant with the use of SUPERFLOC on September 22, 1978. Manually dispensing of chemical powders lends itself toward potentially exposing the worker to an occupational hazard. Good industrial health practices dictate that if a potential for a health problem exists, all efforts should be made to minimize the hazard to the workers. If satisfactory substitutes or improved engineering controls are available, they should be implemented.

RECOMMENDATIONS

Listed below are recommended alternatives to control worker exposure to the flocculating agent:

1. If the present method of dispensing the chemical is continued, provide local exhaust ventilation at each of the respective areas and provide workers with proper protective equipment (gloves, eye protection, and a NIOSH approved nuisance dust respirator). The fans mounted near the funnels should be cleaned to provide some service until such time as local exhaust ventilation or other engineering controls are provided.
2. An alternative to the above recommendation would be to install an automatic dry or liquid chemical feeder to minimize worker contact with the chemicals. The worker would be exposed only when refilling the chemical feeder. Protective clothing should be worn during the refilling process.
3. SUPERFLOC in a liquid form would eliminate workers' exposure to airborne SUPERFLOC dust. A premixture of SUPERFLOC and water should eliminate any exposure to the skin if used with caution, as directed on the container label.