Research Center
December 15, 1959

Memorandum

Asbestos Fibre New Uses Program
Mine Roof Dusting - Final Report

DEC 1 5 1959

Summary

Approximately one million tons of pulverized limestone dust is used annually by the bituminous coal mines throughout the country to coat or dust the walls, roof and floors of all haulageways, airways and back entries of these coal mines. This operation is known as rock dusting.

In the event of an explosion the limestone dust is dispersed from the roof and walls into the air by shock waves and air turbulence where it adulterates any airborn coal dust below the explosion point, thereby arresting the propogation of coal dust flames and preventing widespread explosions.

Introduction

Due to several undesirable characteristics of limestone, such as poor adhesion to the mine roof and walls, low coverage per ton and relatively poor light reflectance it was thought that asbestos, either alone or combined with limestone, might give better performance and a greater factor of safety.

Discussion

Early in 1955 several test applications of asbestos and asbestos-limestone combinations were applied in a mine in Pennsylvania with permission granted by the State Department of Mines. Of the combinations tried, 100 per cent asbestos was thought to be the best by the State Inspector in charge.

Over the following two years these test applications were periodically checked by the State Mining Inspector and JM personnel. At the end of that time it appeared that asbestos had several advantages over limestone, i.e.:

1. Substantially more coverage per sq ft per ton of asbestos.
2. Less dust in the atmosphere during spraying.
3. Retained its lighter color over a longer period of time.
4. After absorbing condensation in the mine due to high summer temperatures and humidity, the asbestos dried out in the fall and regained its original dry dispersible condition.

These favorable results were officially reported by the State Mine Inspector to the Secretary of Mines for Pennsylvania together with a favorable dust count survey conducted by the Industrial Hygiene Foundation of America during the tests with asbestos in the mine. Due to conflict between the Pennsylvania State and the Federal Mining law pertaining to restriction of free and combined silica in materials used for rock dusting, they would not approve the use of asbestos in the State of Pennsylvania until we obtained full approval from the U. S. Bureau of Mines.

With the support of the United Mine Workers Union we were able to persuade the U. S. Bureau of Mines to run a series of tests in their experimental coal mine to check the merits of asbestos floats.

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A copy of the U. S. Bureau of Mines official report covering the meeting when these tests were arranged, a description of the tests, and the final results is attached and is self-explanatory.

Conclusions

In reviewing this final report it should be kept in mind that the most important problem we had to overcome was the U. S. Bureau of Mines Public Law 552 which states that a rock dusting material must not contain more than a total of 5 per centum of free and combined silica; asbestos contains approximately 40 per cent.

The Bureau of Mines felt that the only justification they might have to recommend a change in the law to allow the use of asbestos was if it could be proven beyond doubt in their tests that asbestos could be applied wet to minimize any dust hazard, and then dry out without caking. Or, failing this, if asbestos applied dry would dry out and not cake after absorbing condensation during the hot summer months and show other distinct advantages over limestone.

As indicated in the attached report from the Bureau of Mines both wet and dry applications of asbestos caked to a greater degree than limestone presently used.

Therefore based on these unfavorable results, the Bureau of Mines would not recommend the necessary change in the law, and without this change asbestos could not be used.

In addition to this report a verbal statement was obtained from Mr. John Nagy who stated that based on the results of these tests the use of asbestos did not appear to be practical. The explanation offered regarding the difference between the initial tests conducted in the Pennsylvania State Mine which were favorable, and the tests carried out by the Bureau of Mines was that the latter tests were said tests carried out under extreme conditions.

It is the writer's opinion that further expenditure of time and money would not be justified.

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