

Preliminary questions/comments I have regarding the review of the draft Criteria Document for a Recommended Coal Mine Dust Standard:

1. **Is the derivation of the Recommended Exposure Limit (REL) supported by the scientific data?**

It is unclear what exposure data was used as part of the epidemiological studies to relate exposure to incidence? Also, what specific data was used to determine incidence levels? Was exposure determined from the 1969 Bureau study? Was the MIDAS database used for exposure levels? Was the NIOSH NSCWP study used to determine incidence rates? How does the low participation in Rounds 3 & 4 affect the validity of this data?

The report states "some risk of PMF remains even at 0.9 mg/m³". What is the level of risk at 0.9? On what basis is this an assumed acceptable level of risk? On what basis was the level of risk at 1.2 mg/m³ or higher determined to be an unacceptable level of risk?

The report states that "a definitive determination cannot be made from the chest radiograph alone as to whether changes consistent with pneumoconiosis have resulted from carbonaceous dust or silica dust", that "silica exposure may be a factor in the rapid progression from CWP to PMF", and that "among miners with PMF, 20% had no radiographic evidence of simple CWP at the beginning of the previous 5-year period". This seems to indicate that silica is the key agent in the development of PMF, and supports the recommendation to reduce the silica dust standard to 0.05 mg/m³. Recent studies by the Generic Mineral Institutes for Respirable Dust also appear to support this indication. They have been conducting studies on "Interaction of Coal Dust and Nonhuman Primate Lungs", "Human Alveolar Macrophage and Coal Mine Dust Interactions", "Intervention in the Production of Fibrotic Mediators by the Dust-Exposed Alveolar Macrophage", "Molecular and Biochemical Studies of Dust Lung Interactions", "Dust-Lung Interaction in Coal Miners - Airway Reactivity in Coal Miners", and "Immunological and Inflammatory Pulmonary Mechanisms Associated with Chronic Coal Dust Inhalation in Coal Miners". Have the results of these studies been considered in developing this document? (I will bring references of these studies to the meeting).

From a layman's interpretation, it would appear that silica is the critical component of respirable coal mine dust that must be controlled. The epidemiological data presented in the report does not seem to build a strong case for the impact of coal dust; exposure to coal dust may have an impact on the development of CWP, however PMF is most affected by exposure to silica dust. Information in the Criteria Document appears to support reducing the silica dust standard, but may not contain sufficiently valid scientific data to support reducing the coal mine dust standard to the proposed 0.9 mg/m³ level. It would appear critical that the X-ray surveillance program be expanded to include surface miners, since they have the highest potential exposure to silica dust.

The report states that cigarette smoking is a major cause of COPD, and that the relative contribution of coal mine dust exposure to decrement of lung function cannot be determined. The report also states that the effectiveness of reducing exposure among coal miners with early

development of airways obstruction (before such changes become irreversible) remains to be determined. There does not appear to be sufficiently valid scientific data to support the recommendations concerning chronic obstructive pulmonary disease. Additional studies may be needed before a valid recommendation can be proposed.

2. Are the RELs for respirable coal mine dust and respirable crystalline silica technically feasible?

This question cannot be answered in the abstract. For example, if the primary source of airborne respirable dust on a longwall mining operation is due to face spalls, no known technology exists to control the dust from this source. Each individual mining operation has varying levels of respirable dust from the various dust sources. What has been shown to be an effective control at one operation will not be effective at a second operation if the rank of the source proportionment is not the same. Recent studies have shown that the physical parameters of the coal seam itself can impact the level of airborne respirable dust by an order of magnitude. Thus, even if the source proportionment is equal between the two mines, mine B may have as much as 10 times more airborne respirable dust to control than mine A. Because one mine can reduce dust levels to 1.0 mg/m³, it is invalid to assume that all other mines are able to obtain this level.

The report states that "for most strip mine occupations, the average concentration of respirable crystalline silica exceeds the recommended REL of 0.05 mg/m³. Thus, control of respirable crystalline silica should be a priority for surface coal mining operations". The above cited factors apply equally to surface mining operations. Without an in-depth technical feasibility analysis, it is impossible to speculate whether surface mining operations can obtain the recommended REL for silica.

The U. S. Bureau of Mines has proposed to conduct an in-depth analysis of the technical feasibility for the coal mining industry to meet the recommended dust standards. It is anticipated that this analysis will take six months to complete. Without this type of analysis, it is impossible to render a sound scientific judgement.

3. Should the proposed international definition of respirable dust be recommended as the criteria for sampling respirable coal mine dust and respirable crystalline silica.

The report contains results of studies and discussions conducted by the ISO, CEN, and ACGIH. It appears that there is sufficient technical justification to support this recommendation.

4. Should improvements in the coal mine dust personal sampling unit (CMDPSU) including all-metal construction to minimize charge effects, be recommended? Should performance criteria be developed for approval of more than one type of sampling device?

Addressing the first issue, the report contains sufficient technical information to justify the proposed 1.7 l/min for the CMDPSU. I have

conducted a limited exercise to mathematically validate the conversion factor cited in the report and it appears to be correct. The issue of charge effects appears to be more open to debate and I will submit a more detailed response on this issue in my formal written comments.

On the issue of performance criteria, I am unsure how this relates to the fundamental purpose of the document. What is the purpose of approving more than one type of sampling device? Is there a valid technical need? If so, how may this be off-set by the enforcement/administrative issues?

5. Is the recommended sampling strategy reasonable on the basis of both statistical validity and practical considerations for measuring airborne concentrations of respirable dust in the coal mine environment?

Addressing statistical validity:

It is unclear how requiring the mine operator to submit a written dust control plan every six months improves the current system? If the operation is in compliance at the established REL, what is the value of resubmitting the plan?

It is unclear what the biweekly sampling by coal mine operators is to be used to accomplish? What is the scientific basis for requiring the biweekly sampling?

It is unclear why mine operators' sampling cannot be used for noncompliance? What is the scientific basis for recommending a distinction between compliance sampling by coal mine operators and noncompliance sampling by MSHA inspectors?

The report states "whenever changes in operational conditions might result in exposure concentrations above the REL, air sampling shall be conducted by the mine operator as if it were an initial monitoring survey". How does one define "changes which might result?" The report also states "a sufficient number of samples shall be collected to characterize each miner's exposure". How does one define "a sufficient number of samples?"

The recommendation that "noncompliance be determined on the basis of single full-shift concentrations, including a statistical comparison of the probability that the single sample exceed the REL" appears to be technically valid.

Addressing practical considerations :

The report recommends that "the mine operator shall conduct an initial monitoring survey to determine the exposure of miners to respirable coal mine dust and respirable crystalline silica", and that "every two weeks, the mine operator shall measure the exposure of each DO, DA, DWP, and/or Part 90 miner." Who will be responsible for processing and certifying the results of this sampling? What is the potential financial/administrative burden on MSHA if they are to process these samples?

The report recommends that "the number of samples analyzed for respirable crystalline silica should be increased to one sample per biweekly sampling

period for roof bolters, drillers, and other "high-risk" occupations for exposure to respirable crystalline silica" and that "sampling and analysis for respirable crystalline silica should be performed in accordance with NIOSH method 7500 or 7602." Who will be responsible for processing and certifying the results of this sampling? What is the potential financial/administrative burden on MSHA if they are to process these samples?

The report recommends that "medical records be maintained for workers for at least 40 years after termination of employment, and that copies of environmental exposure records for each worker must be included with the medical records." Who will be responsible for maintaining these records if the mining company no longer exists? Will these records move with the individual as the individual changes employment from mine to mine? What is the potential financial/administrative burden associated with this recommendation?

6. Is the inclusion of spirometry tests in the medical surveillance program justifiable for the prevention of chronic obstructive lung diseases in underground and surface coal miners?

The report states "unlike PMF, chronic occupation pulmonary disease (COPD) also occurs among individuals without occupational exposure", "cigarette smoking is a major cause of COPD", "commonly used spirometric tests may not be useful for identifying specific diseases; age, height, and cigarette smoking are important nonoccupational factors that affect lung function", and that "the relative contribution of coal mine dust exposure to a measured decrement of lung function in an individual cannot be determined." This issue appears to be open to debate and I will submit a more detailed response on this issue in my formal written comments.

7. Is the transfer of miners with evidence of CWF or COPD to low dust areas of the mine medically justifiable at the recommended concentrations of respirable coal mine dust or respirable crystalline silica?

The report states, "some risk of progressive massive fibrosis (PMF) remains even at 0.9 mg/m³", results of "a study estimated that only .01% of PMF cases would be prevented if all eligible miners transferred to less dusty jobs, "these studies indicate that secondary preventive measures such as transfer are not effective in preventing PMF", "studies indicate that PMF may continue to progress even in the absence of further dust exposure", and "the relative contribution of coal mine dust exposure to a measured decrement of lung function in an individual cannot be determined." This issue appears to be open to debate and I will submit a more detailed response on this issue in my formal written comments.

8. Are there additional issues or interpretations of the information that need to be considered in the development of this criteria document?

The apparent original intent of Congress, as stated in the 1969 Mine Health and Safety Act, was to establish an environmental standard to insure that the environment to which a miner is exposed be maintained at or below an established standard. One must view the proposed recommendations in light of this original intent. The original

congressional intent was to provide the mine worker the highest level of protection feasible. One must insure that these proposed changes do not potentially decrease the health protection currently afforded to the coal mining workforce.

The report states that "belt haulageways are a significant source of respirable dust", (NIOSH, 1988). A recent report by the U. S. Bureau of Mines (BuMines RI-9426) concludes: "Using the belt entry as an intake entry may result in additional outby dust sources, however it may also increase the amount of air available for dust dilution. If the belt entry air represents additional air brought to the face; and if belt entry dust levels... are lower than face dust levels, belt entry air may reduce face dust levels. The magnitude of outby dust sources and the dilution effect are mine specific. Any decision to use the belt entry as an intake entry for dust control should be supported with a field study." Based on this study, one may question if "belt haulageways are a significant source of respirable dust". The other safety concerns expressed in the document are addresses in the "Final Report of the Department of Labor's Advisory Committee on the Use Air in the Belt Entry to Ventilate the Production Areas of Underground Coal Mines and Related Provisions". This report appears to resolve many of the concerns expressed in the 1988 NIOSH report.

The document states that "evaluation of the economic feasibility, including consideration of the cost of upgrading or retrofitting mining equipment or of reduced production levels, are beyond the purview of NIOSH." It is appropriate that this economic feasibility study, as well as the previously mentioned technical feasibility study be conducted. The U. S. Bureau of Mines has initiated programming to conduct both these analyses, and it is anticipated that they be completed within the next six to nine month period.

The above addresses the preliminary questions/comments I have regarding the review of the draft Criteria Document for a Recommended Coal Mine Dust Standard. I will submit a more detailed response on this issue in my formal written comments.