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MSHA
Office of Standards, Regulations, and Variances
1100 Wilson Boulevard, Room 2350
Arlington, Virginia 22209-3939

Subject: Comments on RIN 1219-AB64, Coal Mine Dust

Please find attached comments on the subject proposed rules originally published on October 19, 2010.

These comments are submitted by a private individual not associated with any organization or impacted entity. Any reply may be made to evermulen@aol.com.

Sincerely,

Erik Vermulen, CIH
Retired

AB64-COMM-54

Discussion and Recommendation
RIN 1219-AB64
Proposed Rules for Coal Mine Dust Control Dated October 19, 2010

The preamble to these proposed rules rightly identifies excessive cases of CWP and other lung diseases in U.S. coal miners. Our understanding of the cause of these cases does not appear to be without some significant uncertainties. The NIOSH review of the QRA points out that "something is gravely wrong in certain areas" and they identify several explanations for the observed excess cases of CWP.

When looking at the uncertainties in the attached and realizing we now have a data set which can better estimate the life time exposure of individuals that have been struck with CWP, it appears that a revalidation of the risk models should be conducted. Prior attempts to do this validation involved miners that may have had excessive exposures early in their career (i.e. prior to 1972). MSHA's data on respirable dust and quartz exposures in mines when matched with an individual miner's occupational history (mine, occupation, duration, and maybe SSAN/MIIN) can yield a more refined estimate of life-time exposures for specific individual miners who have subsequently experienced CWP. The recent NIOSH epidemiological studies from each of the U.S. coal fields should provide sufficient occupational history to allow a validation of the risk models used in the QRA. A sampling of maybe 500 miners representing each of the coal fields who have contracted 1/0+ CWP could be used to validate the risk models when using these data and possibly identify any baseline (i.e. zero exposure/ false positives) lesions in radiographs. Should factors other than respirable dust concentrations be found to relate to the onset of CWP 1/0+, the proposed PELs should be modified. This may be particularly applicable to coal rank or other measures of dust constituents.

Recognizing the high costs for implementing the current proposed rules for both operators and government, an interim rule should be considered that leaves the PEL at current levels but institutes an eight hour action level of 1.0 mg/m^3 for respirable coal mine dust or 0.05 mg/m^3 for quartz. Once this action level is identified on a single shift for any occupation by either a CPDM or CMDPSU; use of respiratory protection and administrative (e.g. occupation rotation, production limits) or engineering controls could be included in a dust control plan. There may need to have specific authorizations in the rule to identify which administrative control may be considered by MSHA (i.e. limits on production). This approach has the benefit of immediately reducing the exposure of miners; if PAPR respiratory protection is used it also increases miner comfort. It avoids some of the cost with purchasing many added CPDM units and increasing significantly proposed dust monitoring costs. Any respiratory protection program would need to address all the aspects similar to the OSHA program. Criteria for exiting the dust control plan should include demonstration that the action level can be maintained when under normal production or development activities. When last assessed, the CPDM was not compatible with many PAPRs.

EKV

Attachment

Uncertainty Factors

A. Uncertainty in exposure quantity levels in the Risk Model

Original risk estimates of British coal miners described by the National Coal Board's Pneumoconiosis Field Research were based upon assessment of medical outcome and estimates of environmental exposure occurring both before and after medical monitoring began. The approach included an occupational history of work locations and occupation. Environmental sampling was conducted initially with a thermal precipitator and later a MRE sampler. References by Fay and Ashford ('57-'65) on the precise approach used have not been located but there is suggestion they sampled these categories (six) of occupation in the general area of the miners (Jacobsen, '85, Hurley '80). The size of the instruments suggests the samples were not breathing zone but may well have been taken some distance from the miner or in the return air from the sections. Due to short-circuiting of airflow in entries, the return air represents an average but may underestimate breathing zone quantities. Methods used by Attfield and Seixas '95 to estimate dose and exposure ranges were not provided in the reference materials provided by MSHA.

B. Collieries demonstrated wide distribution within and between regions

Original risk estimates varied in the British collieries studied. Quartz level was one of the factors suggested for some miners' response but not the average probability of developing simple pneumoconiosis (Jacobsen '80). There have been indications that exposures to lower quartz levels may lead to lesions not significantly different than those from coal dust particles. Variations in the rates of disease from various regions are still observed, many times related to coal rank or other particulate material. Some characteristic in addition to particle size and concentration is suggested.

C. Using Average life-time dose as indicator (gh/m^3)

Survival and incidence rates use average life-time dose from British studies in ranges of 42 to 390 gh/m^3 where 172 gh/m^3 would represent 45 years at 1920 hours per year direct mining effort and a 2.0 mg/m^3 dose level. No information could be located from the original British or subsequent studies on the range of exposures that occurred within the six occupational categories. By assigning a single annual average environmental dose to a location and occupation for the estimate of exposure, a masking of high exposure levels within the group occurs.

D. Potential for a background level of CWP due to false positives

Attfield ('92) presented a characterization of risk in U.S. mines using exposure estimates from BOM measures prior to '69 and MSHA compliance data after '69. For western high volatility coal at 0.0 mg/m^3 exposure, the predicted incidence of 1/0+ CWP was estimated at 5.5% and PMF at 1.3% using their risk model. Exposure estimates averages in this study ranged from 2.8 to 3.2 mg/m^3 . Exposure estimates were based upon occupations and mine but weakness in the data was recognized. Evidence of a coal rank affect in the CWP was recognized. British estimates of risk were lower than this study. Particle size and composition were suggested as possible reasons. The risk estimates at zero exposure suggest some background level of lesions may exist unrelated to respirable coal mine dust exposure.

E. Uncertainty in reported exposure levels for coal dust and silica

NIOSH in its review of the QRA suggested something is gravely wrong in certain areas of the country; they suggest CWP rates 100 times the national average. Those areas mentioned as a concern appear to have higher rank coal, thinner seams and higher silica levels. The literature also suggests concern over the validity of reported dust levels.

F. Uncertainty in exposures during non-production development

Particulate exposure during development activity where material production levels are significantly below normal but involve rock cutting (slope development, roof cutting for travel ways or equipment set-up) may involve excessive exposure to silica but may not be routinely monitored due to the short duration of the task. There are indications these activities may occur on 'non-production' shifts and not receive adequate monitoring by either operators or MSHA. MSHA policy to monitor normal production shifts may underemphasize these exposures. Attfield '92 and Hurley '82 suggest quartz may be a factor in the unanticipated variance and that some miners may react differently to infrequent peak quartz exposure.

G. Uncertainty over the impact of exposure excursions of coal dust and silica on morbidity

Risk models have focused on life-time exposures with little data investigating excursions. Indeed, the excess morbidity related to the age suggests extended residence time for insoluble particulate in the lung may increase morbidity rates. This suggests high exposure early in one's career is more detrimental than massive exposures later on. However, the literature on silica suggests that relatively short exposures (weeks) to massive levels of silica may lead to rapid onset of disease. Parobeck '79 indicated the majority of samples did not achieve $< 2.0 \text{ mg/m}^3$ until approximately '76 for high risk occupations in 20 mines.

H. Uncertainty over the implication of extended shifts

The QRA indicates the risk models used assume a total life-time dose that does not account for work shifts over 40 hours per week or overtime beyond 1920 hours per year. If it is truly the life-time dose, then non-conventional rotating shifts (4-10s or 4-12s with an extended break between) would have no impact on risk so long as the exposure duration over the year was held to 1920 hours. It should be anticipated that peak dose exposures and extended shifts could impact physiological protective measures and recovery time. No data could be found that addressed these uncertainties.