

information in mine ventilation plans such as the VPL, shift length, etc.; and (d) provide the miners' representative the opportunity to participate in the plan verification process.

During sampling to secure plan approval, the district manager could approve a plan based on one shift of sampling if the VPL is achieved, and respirable dust concentrations are sufficiently low. However, if dust concentration measurements are higher, or if the actual production was less than the VPL, the mine operator would be required to sample additional shifts.

3. Measures To Supplement Engineering Controls to Reduce Exposures

Under the proposed rule, if a ventilation plan cannot be verified using all feasible engineering or environmental controls, the mine operator may be permitted to use either powered, air-purifying respirators (PAPRs) or verifiable administrative controls, or a combination of both, as a supplemental means of control (see section III.D. Hierarchy of Dust Controls). MSHA may, under certain conditions, approve such use only after the Administrator for Coal Mine Safety and Health has determined that all feasible engineering or environmental controls have been adopted in the ventilation plan, but miners continue to be at risk of overexposure. District managers may also approve the use of supplementary controls for limited periods of time when unusual or intermittent adverse conditions could result in miners not being fully protected by the approved dust control plan.

These and other provisions of the proposed rule are explained in more detail in the Section-by-Section Discussion of this preamble.

C. Control of Coal Mine Respirable Dust

Maintaining a work environment free of excessive levels of respirable coal mine dust and quartz dust (hereafter referred to as "respirable dust") is essential for long-term health protection. Section 202(b)(2) of the Federal Mine Safety and Health Act of 1977 (Mine Act) requires each operator to continuously maintain the average concentration of respirable dust in the mine atmosphere, during each shift to which each miner in the active workings of such mine is exposed, at or below 2.0 milligrams of respirable dust per cubic meter of air (mg/m³). Under the Mine Act and the implementing regulations, when respirable coal mine dust contains more than five percent quartz, the applicable dust standard is further reduced by means of a formula.

Although MSHA does not enforce a separate standard for respirable quartz dust, the formula (10 divided by the percentage quartz) used to establish an applicable dust standard, in effect, limits respirable quartz concentrations to 100 µg/m³ (as an MRE equivalent).

Consistent with the Mine Act and MSHA regulations, the primary focus of the federal respirable dust program is on controlling the concentrations of respirable dust in the environment where miners work or travel through the application of feasible engineering or environmental control measures.

Engineering or environmental controls for respirable dust in the mine environment are the proven dust-control techniques and the principal methods for protecting miners' health. These include all methods for controlling the quantity of respirable dust in the air that a miner breathes by either reducing dust generation, or by suppressing, diluting, capturing, or diverting the dust that is being generated by the mining process. Under the Mine Act, the mine operator has primary responsibility for implementing a program to control respirable dust so that all miners work in an environment free of excessive levels of respirable dust. Mine operators must develop, implement, and maintain effective measures to control the level of respirable dust in the mine environment, and evaluate these control measures at regular intervals to ensure that they function as intended. These control measures, or "dust control parameters," are required to be specified in the dust control portion of the operator's mine ventilation plan under § 75.370.

Mine ventilation plans are a long-recognized means of addressing health issues that are mine-specific and for achieving work environments that are free of excessive concentrations of respirable dust. Currently, section 75.370 requires each operator of an underground coal mine to develop and follow a ventilation plan that is designed to control methane and respirable dust in the mine. The plan must be suitable to the conditions and mining systems employed at the mine. Although ventilation plans must be designed to control respirable dust, there has been no requirement that the plan's effectiveness be verified.

The dust control portion of the mine ventilation plan is a key element of the operator's strategy to control respirable dust in the working environment of each mechanized mining unit (MMU) during each shift. Existing section 70.2 defines, in part, a MMU to mean "a unit of mining equipment, including hand loading equipment, used for the

production of material." The plan provides a description of the specific engineering control measures in use. The plan also contains procedures for maintenance of specific dust control equipment, such as scrubbers, dust collectors on roof bolters, and spray nozzles, or for the replacement of cutting picks to minimize dust generation. Once approved by the district manager, the dust control parameters must be employed on a continuous basis to provide protection from the hazards of respirable dust to coal miners. By insuring that the parameters are being maintained on each production shift, miners can be assured that respirable dust levels are being adequately controlled without the need to continuously monitor respirable dust levels in the mine environment. Implementing dust control parameters that have been determined effective under typical mining conditions, and maintaining these controls in proper working order, provides reasonable assurance that no miner will be overexposed. Because technology that continuously monitors respirable dust and displays dust concentrations in real-time is not yet available for use in underground coal mines, the implementation of effective ventilation plans is the only practical means of reasonably ensuring, on a continuous basis, that miners are not overexposed.

In 1996, MSHA implemented revised ventilation standards which, among other provisions, required an on-shift examination of the dust control parameters before coal production begins on each MMU to assure compliance with the dust control parameters specified in the ventilation plan. Based on the recommendations of MSHA's Coal Mine Respirable Dust Task Group (MSHA, 1992), this requirement is intended to focus attention on the need for properly functioning dust controls before production begins. On-shift examinations of dust control parameters under existing § 75.362 are one important component for an effective respirable dust control strategy. Recent advances in technology make it feasible to continuously monitor certain parameters, such as air quantity and velocity and spray water flow rate and pressure (Spencer, *et al.* 1996). Existing § 75.362 encourages the use of such monitors as it would eliminate the need for periodic physical measurements of some dust controls to verify if they are operating properly. Although current technology allows real-time data to be obtained on certain dust control parameters such as air quantities,