

compliance with the respirable dust standards of subpart B of part 70. (Energy West, September 1997).

Energy West contended that PAPRs are necessary as a supplemental means of controlling respirable dust because even the most diligent application of feasible engineering or environmental controls could not always prevent overexposure. This proposed rule responds to Energy West's petition for rulemaking.

Although, as stated above and elsewhere in the preamble, the Agency does not believe that supplementary controls are as effective or as safe as engineering controls, MSHA believes, on balance, that under certain circumstances reliance upon the limited use of such measures is appropriate. Accordingly, MSHA is proposing to permit the limited use of either approved PAPRs, administrative controls, or a combination of both, for compliance purposes, in those circumstances where further reduction of dust levels cannot be reasonably achieved using all feasible engineering controls. In these situations, the burden of proof of infeasibility is appropriately placed on the operator. Also, as provided for under proposed § 70.212, MSHA recognizes that the use of PAPRs as a supplementary control may be appropriate on an intermittent basis when unusual operating conditions are encountered that adversely impact the ability of the previously verified plan parameters to effectively control respirable dust under prevailing conditions. MSHA will permit the use of PAPRs for a period not exceeding 30 calendar days if the operator demonstrates that the particular circumstances that necessitate the use of PAPRs occur only intermittently and are beyond the control of the operator.

While the conditions under which MSHA would permit supplementary controls to be used introduces an added element of complexity to the proposed standard, the Agency believes that it will provide operators the flexibility to select the most appropriate option for supplementing the engineering controls which best meet the needs of the miners under the prevailing operating conditions.

MSHA believes that the use of these supplementary control measures, under the conditions of use set forth in the proposed rule, will enhance the level of health protection for miners by preventing overexposures on all shifts when engineering controls cannot achieve the necessary reduction to or below the applicable dust standard. The combination of engineering and supplementary controls will provide reliable and effective exposure control

when used in accordance with the approved plan provisions. This proposed rule, which provides for expanded use of supplementary controls under limited circumstances to protect individual miners, is not a departure from the Agency's long-standing practice of relying on engineering controls to achieve compliance, since these measures would not be used as a substitute or replacement for engineering control measures in the active workings. Rather, it is a recognition that, in those limited instances where supplementary controls may be used, engineering controls alone may not protect some miners from overexposure.

a. Selection of Respirators: Powered Air-Purifying Respirators (PAPR)

By choice, underground coal miners wear various styles of respirators to protect themselves from exposure to respirable coal mine dust including: disposable filtering facepieces, tight-fitting elastomeric masks, and PAPRs. Currently, over 50 percent of the operating longwall mines have miners who have chosen to wear PAPRs (MSHA, Longwall Summary, January, 1999) for added protection.

The Racal® Airstream, or air helmet as referred to by miners, is a type of loose-fitting PAPR which has long been the respirator of choice in underground coal mines. Due to the weight of the device, its use has generally been limited to mines with coal seam heights exceeding six feet. The functional and physical characteristics of air helmets, as described below, make them especially well-suited to underground coal mining conditions. Accordingly, MSHA has chosen PAPRs as the type of respirator to be used when such devices are approved under this proposed rule.

The air helmet has been in use in underground coal mines since the late 1970s. Developed primarily for mining use by the Safety in Mines Research Establishment (SMRE) in England, this respirator combines face, head, and respiratory protection in a single convenient unit. The support hardware, which provides the filtered air, is enclosed within the air helmet. Power for the system is provided by a belt-mounted battery. Mine air enters the helmet through a rear entrance port, passes through a pre-filter assembly that removes the coarse material, and then passes through the fan and into a final filter assembly that is located between the head of the wearer and the outer helmet shield. The filtered air then sweeps down across the wearer's face, behind the face-shield visor, imposing minimal breathing resistance, and exits

at the chin. A partial seal between the visor (inlet covering) and the face is accomplished using a flexible medium which contours to the wearer's neck and face. The original air helmet has undergone numerous design improvements since it was first introduced in British coal mines. The unit is now produced by the Minnesota Mining and Manufacturing Company (3M) (3M™ Helmet-Mounted Airstream™ series).

Unlike other styles of PAPRs (e.g., hoods) and negative pressure, tight-fitting respirators, the air helmet is better able to provide various types of required personal protective equipment in an efficient package. For example, in addition to protecting the lungs, the helmet and visor (the inlet covering) of a PAPR can simultaneously protect the face and head from high-velocity nuisance dust, spray, and small pieces of coal from the cutting drums and face. PAPRs do not require fit-testing, unlike tight-fitting respirators.

By definition, for PAPRs to be approved for use under this proposed rule, the visor must form a partial seal with the face, limiting entry of unfiltered mine air. Because this style of respirator does not have a tight-fitting facepiece, miners are not required to be clean shaven in order to wear this respirator correctly. MSHA's allowance of facial hair with this style of PAPR is also consistent with the Occupational Safety and Health Administration's (OSHA) regulation that facial hair prohibition applies only to tight-fitting respirators (29 CFR 1910.134 (g)(1)(i)(A) as discussed in 63 FR 1152). MSHA recognizes that there may be facial conditions which may prevent the proper fit of a PAPR. However, a well-designed respirator protection program should identify and address any extreme facial conditions, including excessive facial hair, which prevent the partial seal of the inlet covering and the face as intended, and thereby compromise the efficacy of the PAPR. For example, a miner could have exceptionally bushy sideburns which prevent the inlet covering from forming an appropriate partial seal with the face, and leave a significant gap between the inlet covering (visor) and chin. This situation would have to be rectified in order for the PAPR to be worn properly.

Greenough (1978) summarized limitations of other styles of respirators as follows:

[T]he objections to conventional face-mask respirators arise primarily from the mask being clamped to the wearer's face, often causing irritation and soreness; also the breathing resistance, though small, can affect the wearer's capacity to work over long