

overexposed to DPM or that the filter should be removed from service. This test may give an indication to the mine operator that a fault is starting in the filter, and subsequently, that the DPM emissions could be increasing.

MSHA asked for comments concerning what technical assistance the Agency should provide to mine operators in retrofitting DPM control devices and evaluating ventilation systems or filtration of cabs. Commenters stated that MSHA should provide guidance in all these areas that involve control technologies. MSHA has been and will continue to provide these types of compliance assistance to underground metal and nonmetal mine operators. Mine operators are encouraged to use the Agency's DPM Single Source Page that includes comprehensive compliance assistance tools addressing the aforementioned issues as well as others.

MSHA has been instrumental in providing compliance assistance to the mining industry. MSHA conducted a number of outreach workshops throughout the country to discuss requirements of the DPM standard and sampling and control technology information. These meetings were held in Lexington, Kentucky; Kansas City, Missouri; Green River, Wyoming; Albuquerque, New Mexico; Elko, Nevada; Coeur d'Alene, Idaho; Knoxville, Tennessee; Des Moines, Iowa; and Ebensburg, Pennsylvania. MSHA also completed baseline sampling at the underground mines covered by the DPM standard, and made site-specific compliance assistance visits.

To further assist mine operators, MSHA and NIOSH have developed compliance assistance tools, many of which are currently available to operators on MSHA's DPM Single Source Page on MSHA's web site. The NIOSH mining web page is available to mine operators as well. Mine operators should give special attention to MSHA/NIOSH's Filter Selection Guide. As explained earlier in this preamble, this document provides mine operators with detailed step-by-step selection factors that can be applied to particular pieces of diesel-powered equipment in their mine. It is an interactive compliance assistance tool that allows mine operators to answer questions on their individual mining operation to select, retrofit and maintain the best available filter technology. This guide will be updated as new technologies are introduced in the underground mining industry.

Also included on MSHA's DPM sole source web page are the Estimator

computer program; a list of available filters and manufacturers; the draft DPM compliance guide which contains MSHA's enforcement policy; MSHA sampling procedures; the slide presentation from MSHA's outreach seminars on the requirements of the DPM standard; information on how MSHA calculated the error factor to be used when making compliance determinations; a troubleshooting guide for addressing problems with control technology; along with the NIOSH notes from the filter workshops as discussed above. In addition, MSHA has posted "Best Practices" for various issues concerning the use of DPM filters.

MSHA also provided compliance assistance at individual mines through its involvement with bio-diesel projects, fuel catalyst installations, and in-mine evaluations of DPM filter technologies. MSHA's diesel testing laboratory located in Triadelphia, WV has been active in evaluating many of these control technologies. The Agency tested and provided information on the effects, if any, on nitrogen dioxide production for specific catalyzed DPM filters.

The Agency continues to consult with the Metal and Nonmetal Diesel Partnership (the Partnership). The Partnership is composed of NIOSH, industry trade associations, and organized labor. MSHA is not a member of the Partnership due to its ongoing DPM rulemaking activities.

A discussion of additional comments follows.

One commenter responded to MSHA's ANPRM questions regarding retrofitting engines by stating that anything other than the original engine model is unsuitable for a piece of diesel powered equipment. According to this commenter, this would require prohibitive design engineering analysis and implementation. MSHA agrees that on some machines it may not be feasible to change engines. As engine manufacturers develop cleaner engines, however, the older models are being phased out and newer, cleaner engine models are available from the same engine manufacturer. In some cases, the new engine models are direct replacements for an older model. Among the benefits of retrofitting a piece of diesel powered equipment with a cleaner engine are better fuel economy, reduced DPM emissions, improved lubrication systems, and better diagnostic tools, especially with the electronic engines. A cleaner engine that emits less DPM will deposit less DPM on the filter, thus resulting in longer intervals between regenerations, especially in active regeneration

systems or combination active/passive regeneration systems.

MSHA asked for comments on whether cabs would be feasible and appropriate for controlling DPM exposures. Commenters responded that operators normally would not purchase a cab to control DPM. Cabs are used for controlling exposures to respirable dust, however, and the results of MSHA's sampling at the Greens Creek mine (MSHA, January 2003) show approximately 85% reduction in DPM when using a filtered cab on a loader. Cabs, however, do not protect workers outside the cab or downwind in series ventilation systems.

Another commenter stated that dimensional constraints of their mine preclude use of cabs on equipment. MSHA is aware that some mines may not be able to use cabs due to dimensional constraints. Environmental cabs can be an effective feasible DPM control device for some mine operators. Many new pieces of diesel powered equipment are sold with enclosed cabs. Besides DPM exposure, an enclosed cab with filtered breathing air would also help reduce exposure to other airborne contaminants and noise.

Commenters provided information on the cost of filters, for both passive and active systems. Information stated that active systems, depending on product specifications, had a higher cost. MSHA agrees with the commenters on cost. However, some of the higher costs of the active system can be spread out over several vehicles. This means that several filters that need active regeneration can be done at the same regeneration station when filters are removed from the machine. The mine can purchase backup filters for each machine and only one regeneration station. If operators chose active, on-board, regeneration, the unit that the machine plugs into can be available for several machines. As stated previously, mine operators may need to administratively adjust machine operating schedules to accommodate active regeneration. MSHA believes that this filter technology is economically feasible for the industry.

One commenter stated that there has been little experience with off board regeneration. MSHA is aware of successful applications in M/NM mines with active regeneration units. MSHA has posted on its homepage best practices for active regeneration stations in M/NM mines. Several problems that have been reported on active regeneration stations are discussed below in association with regeneration stations located at mines greater than 5000 feet in elevation.