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Mine Safety and Health Administration
Office of Standardas, Regulations and Variances
Room 2352
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Via-Email

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November 11, 2002

RE: Diesel Particulate Exposure of underground Metal Nonmetal Miners

First allow me to introduce myself, my name is Gene Davis, Labor Representative, (nominated by the United Mine Workers of America) on the Pennsylvania Technical Advisory Committee for Diesel Powered Equipment in Underground Coal Mines. As a member of this comittee I have been very active in diesel rule making for underground coal mines.

I have recently read through the listing that appeared in the Federal Register on September 25, 2002 which ask for comments on proposed rule making for the Diesel Particulate Matter Exposure of Underground Metal and Nonmetal Miners. (30 CFR Part 57) . Even though I work within the confines of underground coal mine diesels I feel compelled to make the following comments and suggestions for this proposed rule making.

***What is the appropriate interim and final concentration limits if EC is used as a surrogate?**

Before we can decide on what concentration limit if any would be appropriate if EC were to be used as a surrogate for DPM we need to take a look at where this all started.

In the preamble it was stated that the interim limit for DPM would be 500 ug/m3, that is total DPM which is made up of three main constituents, solid fraction (EC) + soluble organic fraction (OC) + Sulfates which equals, Total Diesel Particulate Matter (DPM). It was then decided that Total Carbon, which is the sum of EC and OC, makes up about 80 to 85% of diesel Particulate Matter and it would be used as a surrogate for DPM. Even this assumption is only accurate if we are talking about raw untreated exhaust, because if the engine in question is using either an oxidation catalyst or precious metal catalyzed soot trap the percentage of sulfates in the exhaust flow will greatly increase.

First we had Total Carbon (TC), which is the sum of both Elemental Carbon (EC) and Organic Carbon (OC), being used as a surrogate for DPM. Now it appears MSHA has decided that it may be easier to use Elemental Carbon as a surrogate for Total Carbon, but remember Total Carbon was to be a surrogate for DPM.

I believe this to be an accurate depiction of what has transpired but I may be wrong! Well at any rate I do not believe you can accurately measure DPM by using EC.

If you are looking for a number or a formula to calculate exactly the amount of elemental Carbon (EC) in the exhaust stream of all diesel engines, it doesn't exist. The composition of Diesel Particulate Matter varies greatly depending on the engine technology, atmospheric conditions, and many other factors. I believe you should go back to the original surrogate of Total Carbon, which will give a more accurate result of measuring DPM. But we must not forget that DPM is not Total Carbon, but Total Carbon + sulfates. After all this is MSHA's definition of Diesel Particulate Matter.

***You ask what error factor should be used if Elemental Carbon (EC) is chosen as a surrogate for Total Carbon?**

I do not beiieve there is a constant error factor that can be used to accurately calculate the amount of EC in the exhaust stream of any given engine. To back up this statement I offer the following example.

If a diesel engine is in a state of deterioration to where it is burning lube oil or if the fuel injectors are clogged to where the engine is not in good tune will Elemental Carbon (EC) still be present in the exhaust flow at the MSHA advertised rate of 77% of Total Carbon?

We know that diesel engines running out of tune or running in a bad state of deterioration will have increased levels of both EC and OC, but will the increases be proportional?

You may say that it doesn't matter if the increase is proportional, since the amount of EC in the ambient atmosphere will be elevated, and normal sampling will pick up the increase. This would be fine if we were measuring only for EC but we are using EC as surrogate for Total Carbon that is why it is imperative that EC and OC remain proportional or as close as possible.

To achieve some semblance of proportion between EC and OC I am suggesting the inclusion of a periodic Diagnostic Emissions Test. This emissions test should be fashioned after the weekly emissions test (30 CFR Part 75.1914(g)) required by MSHA in coal mines for permissible and heavy-duty equipment. This test would use the gaseous emissions to baseline the engine then at regular intervals the engines gaseous emissions would be checked against the baseline to insure the engine is in tune and operating properly. Virginia and Pennsylvania also use a type of this test on all underground coal mine equipment. Since MSHA seems bound and determined to use EC as a surrogate, at least by including this emissions test you will be more accurate in your assumption that EC is a certain percentage of Total Carbon.

Allow me to expand on this concept.

It is my understanding that MSHA has agreed to use EC as a surrogate because of the likely interference of smoke and drill mist which will give elevated levels of Organic Carbon. It is because of these types of interference that an emissions test must be included in this proposed rule. If the above mentioned emissions test is not included then whenever or wherever a high level of OC is encountered it will be explained away as interference and the sample will have to be discarded. This will happen even when the elevated reading of OC is from an engine in a state of deterioration. If this were allowed to happen it would be an injustice for the workers, after all the reduction of DPM is what this rule is supposed to achieve.

Another problem I see in trying to use EC as a surrogate for Total Carbon is the use of Diesel Particulate Filters. It is well known that these filters reduce EC by 90 to 99%. We also know that they do not work quite as well on OC, which will basically render any formula or calculation that has been applied useless. This is one more reason that the emissions test should be instituted, at least in this way you could be sure that whatever relationship you establish between EC and OC that the relationship will remain fairly constant in the exhaust flow.

What circumstances would necessitate an extension of time to come into compliance?

There should be no need for any more extension for compliance. This rule has been advertised since January 19,2000, MSHA has already given until July of 2003 before they will start to enforce, by enforce I mean write citations. Why would any one need more time when the technology needed to reduce the DPM to the final standard is available today? As a matter of fact the technology was available when the rule was introduced in the year 2000, as the VERT study concluded in 1998. Allow me to quote from the sumnary of that study which was published in April 1998.

"The filter technology is therefore technically feasible, controllable in the field and cost effective. Thus, all prerequisites are fulfilled for wide scale deployment of this technology for improving the respiratory air quality at tunnel sites and therefore protect the occupational health of the employees.

I reiterate there should be no need for further extensions to come into compliance, it is time to actually start protecting the health of the workers.

Section 57.5060(e) Certain exceptions to the concentration limit.
What would be the impact of removing this provision?

If the primary objective of this rule is to protect the health of the workers then clearly there can be no exceptions, or is it just that those few mechanics or those people making inspections should not live by the same rules and get the same health benefits as the rest of work force?

57.5060(e) and 57.5060(f) Prohibition of both personal protective equipment and engineering controls.

I sincerely believe in this era of technology there is no need to strap a respirator on anyone to achieve compliance with this rule. As stated earlier the VERT study of 1998 was done on a tunnel project. I am sure that most if not all the equipment fitted at that time with DPF's were comparable to the machines used in the metal, nonmetal industry. Also there are quite a few metal nonmetal mines in Canada that are using hot gas filters quite successfully and as reported at the recent MDEC conference there are more DP filters being ordered. Why would MSHA even entertain the idea of allowing personal protection or engineering controls when this rule can be met now with existing filter technology.

I have to take some time and make the following statement: ***It is not that this rule can not be met with available technology it is that the operators are looking for the magic bullet, by this I mean that they want technology that can be screwed on and forgotten, after all this is how they have done business in the past. These operators need to realize that those days are gone! If you are to meet this rule then this is what must happen. First, pick the type of after-treatment system that will work for your fleet, then secondly and most importantly make a commitment to the maintenance of the diesel engines and the after-treatment system you have chosen. If the operators take this approach they should all be able to meet the final concentration limit of 160ug with out any further extensions and without any person being exempt from the rule and most importantly no one will have to wear a mask to be considered in compliance!***

Section 57.50610 Personal sampling

MSHA states that it will conduct personal samples for DPM only, instead of using a combination of area, occupational and personal samples. As an underground coal miner for the past 30 years it has been my experience that any ambient sampling should include all of these types of samples. If this rule is to be an ambient exposure limit, then a certain amount of area sampling must be coupled with occupational and personal samples. Allow me to explain. Personal samples are the easiest to manipulate, in many cases the manipulation is not intentional, it is just that the individual being sampled may have to leave his normal area to perform other work. Along with that type of manipulation, you will always have the unscrupulous operator that will purposely send a worker who is being sampled to a location that is likely to have less DPM present. It is because of these reasons that I believe it imperative that area samples and occupational samples be incorporated into the rule. I also do not agree with MSHA in allowing workers to be sampled in the cab of a machine. This type of sampling may be fine for surface areas where the dust and DPM dissipate or better yet are blown away quickly. However we must remember we are not dealing with an open atmosphere but a captive one, where the DPM that is created by the equipment with a cab will flow into other areas of the mine where people that do not have the protection of that cab are working. Perhaps MSHA should sample both inside the cab and the outside the cab at the same time. To reiterate in my experience it has been necessary to use a cornbination of personal, area and occupational samples to properly evaluate the level of dust or in this case DPM in the ambient atmosphere.

In closing I would like to reiterate my position that this rule can be met with existing technology. The problem is as previously stated, the operators are looking for that "magic bullet" and it does not exist, nor will it ever be created. Why should these workers have to wait any longer for a clean work environment? What new promise is on the horizon? What new technology are we waiting on? It is time to clean up the working environment for these men; as a matter of fact it is long over due!

If you need clarification on any of the statements made in this comment I may be reached by phone at 724-737-5213.

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From: gedavis@bellatlantic.net
Sent: Friday, November 22, 2002 11:43 AM
To: Comments@MSHA.gov
Subject: Diesel Particulate Exposure - Metal Nonmetal Miners

Via Email
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Metal Nonmetal rule

Please except these comments in the spirit in which they are being offered.

Gene Davis